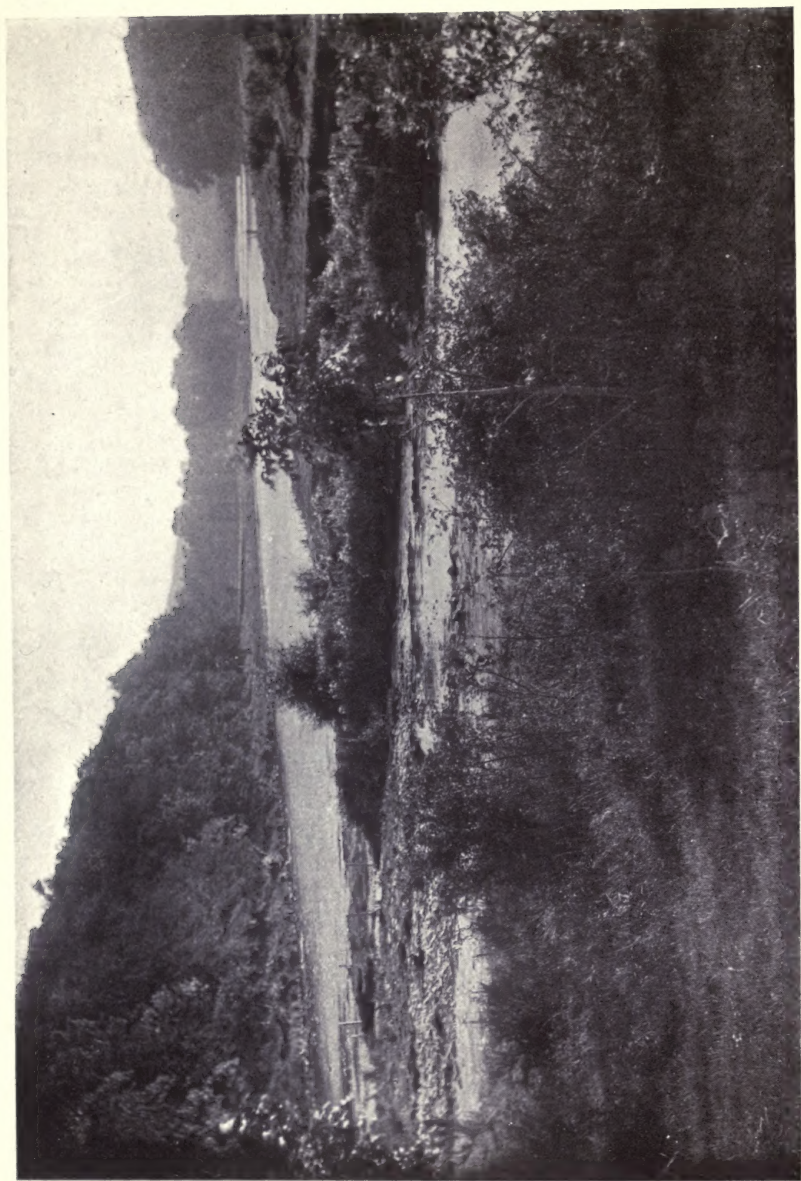


THE
ADVENTIVE FLORA
OF TWEEDSIDE



Digitized by the Internet Archive
in 2007 with funding from
Microsoft Corporation

THE ADVENTIVE FLORA
OF TWEEDSIDE.



JUNCTION OF THE GALA AND THE TWEED.

THE ADVENTIVE FLORA OF TWEEDSIDE

BY

IDA M. HAYWARD, F.L.S.,

AND

GEORGE CLARIDGE DRUCE,

Hon. M.A. (Oxon), LL.D. (St Andrews), F.L.S.,

Fielding Curator in University of Oxford; Hon. Secretary, Botanical
Society and Exchange Club of the British Isles.

188127.
3.3.24.

ARBROATH: T. BUNCLE & CO.

1919.



DEDICATED
TO
Dr ALBERT THELLUNG
OF ZURICH
IN RECOGNITION OF HIS KINDLY HELP
AND WITH
HOMAGE FOR HIS LABORIOUS WORK
IN CONNECTION WITH
THE ADVENTIVE FLORA OF EUROPE

PREFACE.

THE adventitious or alien flora of Tweedside is so interesting and in extent so exceptional that no apology need be made for placing on record the results of the investigations of my colleague, Miss I. M. Hayward. Investigations of great value in themselves, they are of recognised importance in confirming and extending our knowledge of plant distribution.

This adventitious flora is intimately connected with the staple trade of Galashiels, around which the investigations have been made, and where Miss Hayward found ample scope for her botanical researches. Her present work was aided and supported by her uncles, the Messrs Sanderson. Engaged in the woollen industry, they gave her ready access to the mills and the various processes which ultimately released the seeds from their resting place. Advancing times have brought about changes, and the number of aliens is no longer likely to increase. In former times at Galashiels the effluents from the woollen mills carrying seeds washed out in the course of scouring found their way into the river, but in recent years a system of drainage has been introduced whereby these impure waters are intercepted and conducted into septic tanks, where, under drastic treatment, all or nearly all the seeds present are destroyed. In the near future, therefore, instead of a large alien flora appearing along the rivers only a few sporadic species can be expected to occur, and further waiting would add little to the book now published.

For assistance in determining the very difficult plants we are especially indebted to Dr Albert Thellung of Zürich, the accomplished author of the classic, "*La Flore Adventice de Montpellier*"; to Dr Murr, the well-known authority on the *Chenopodiaceae*; and to Prof. E. Hackel, the great Austrian authority on the *Graminaceae*. In Britain we are under obligations to Sir David Prain, F.R.S., Director of the Royal Botanic Gardens, Kew, and his able staff, especially Dr Stapf, Mr J. Hutchinson, and Mr W. B. Turrill; to Prof. I. Bailey Balfour, F.R.S., and his staff of the Royal Botanic Gardens, Edinburgh; to Dr A. B. Rendle, F.R.S., and the staff of the Botanical Department of the British Museum of Natural History, especially Mr E. Gilbert Baker; to Prof. S. Vines, F.R.S., the Sherardian Professor of Botany at Oxford; to the President and Fellows of the Linnean Society; to the President and Fellows of the Botanical Society of Edinburgh and to Prof. A. Seward, F.R.S., Botany

School, Cambridge, for permission to consult the collections under their care, and other help. For much historical and statistical information we are indebted to the late Mr Robert Hall's valuable and interesting "History of Galashiels"; and for other data to the exhaustive work on the "Structure of the Wool Fibre," by F. H. Bowman, D.Sc.

Our thanks are also due to Mr A. Robinson, of the University Museum, Oxford, for preparing some beautiful photographs, that of the fruit of *Erigeron bonariense* receiving a prize from the Photographic Society. Rev. F. Bennett, M.A., Mr F. N. Williams, and Mr R. H. Corstorphine have added to previous acts of kindness by the onerous task of proof-reading. Dr Albert Thellung has also rendered material aid by his valuable suggestions.

The previous works in this branch of Tweedside Botany are few. The earliest is by a medical student, Mr G. C. A. Stuart, who read a paper on Tweedside Plants, which included a few aliens, at a meeting of the Chirnside Club on September 24, 1868, and which was published in the *Proceedings of the Berwickshire Naturalists' Club*, 1869-72. This was followed by Mr Andrew Brotherston's "Tweedside Plants of Recent Introduction," also appearing in the *Berwickshire Proceedings* in 1872 and 1873-75. Brotherston was an old correspondent and contributor of plants to the writer from 1874 to 1888. He was born at Eccles, in Berwickshire, in 1834, was a gardener at Kelso for many years, and there he died in 1891. He prepared a list of the Peebles plants for the Botanical Record Club in 1879, and sent many records for the other Tweedside counties for several years, adding to them a large number of new species. He was one of the earliest observers who drew attention to the woollen industry as a factor in the introduction of foreign plants into this area. Mr J. Fraser of Leith, who has done such excellent work at the alien flora of that neighbourhood, also published papers in the *Annals of Scottish Natural History*, 1911, the *Scottish Botanical Review*, and the *Transactions of the Botanical Society of Edinburgh*, 1911 and 1914, and opportunity is here taken to acknowledge his kind assistance.

The number of Tweedside aliens in all these papers was, however, only 89, and it has been reserved for Miss Hayward to bring the number up to 348, at which it at present stands. There are also 294 species of adventitious plants other than wool aliens now recorded for Tweedside.

It may be as well to state here the respective share of the two authors of this work. To Miss Hayward fell the task, and it has been no slight one, of finding nearly all the species enumerated here. Year after year she has industriously explored the pleasant banks of the Gala and Tweed, and taken hazards frequently in both these waters, with the good fortune that often attends the adventurous. The plants had to be carefully laid out, dried and mounted, and her herbarium is probably unique in Britain in respect of the number of local adventitious plants it contains. In these explorations not only were there a large number of plants found for the first time in Britain, but many

were new to Europe, and a few were important additions to science, inasmuch as at present the native home of some of them is conjectural, although from relationship to species already described their nativity can be predicted with some degree of certainty. Miss Hayward has also supplied the local notes respecting the time and place of occurrence and the flowering period of the various species.

The writer's share of the work has been to prepare the Introduction, to classify the plants, and to write the botanical text and descriptions. He trusts the united efforts may result in giving for the first time in Britain a not uninteresting account of the adventive flora of a district which, with the exception of Montpellier, is acknowledged to be the richest in Europe. May the local industry which is responsible for it long continue to flourish.

G. CLARIDGE DRUCE.

OXFORD, July 1919.



SOUTH AUSTRALIAN MERINO RAM.

INTRODUCTION.

THE woollen industry of Galashiels is the immediate source of the adventitious or alien plants in the Tweedside district here recorded. It is therefore important to glance at the position and history of the burgh.

As a town it boasts no great antiquity, for, despite its name having been spelled in nearly a score of different ways, its probable derivation is from the words "guala," a full stream, and "shiel," a shelter, the latter word designating the huts or dwellings which were so frequently destroyed by the predatory incursions of the Southern invader. In early days this must have been a favourite haunt of anglers, for down the narrow glen flows the Gala, on whose banks, extending for two miles, the town is built. But it is a land of rivers. For the Tweed about 100 feet above the datum mark of the Gala at Galashiels (400 feet) flows in a broad strath, the north-east side being crowned by the Peeblesshire hills of Glebe Knowe (1936 feet), and the south-western side by the Selkirkshire Minchmoor (1836 feet). It is then a noble stream, which, passing by the romantic tower of Elibank and its woods, gay with the Swiss elder, reaches Caddonfoot, where it sweeps westward round the hill of Meikle (1327 feet) till it joins the Ettrick near Lindean; thereafter turning eastward by Abbotsford it meets the Gala about a mile below Galashiels. Had the depression between Meikle and Crosslee been 200 feet lower the Tweed would have followed the course of the present railway and joined the Gala above not below the town.

The somewhat bare country-side to the west and north of the town was formerly well-wooded, forming, as it did, part of the Crown forest of Ettrick, where "hart and hind and doe and roe and of wilde beasts great plenty" were reserved by the Scottish princes "for the pleasures of the chase"—a fair royal forest which Robert Bruce granted in 1321 to Sir James Douglas. That the Gala did not always flow in the same bed is suggested by the fact that in 1268 Simon Fraser, Sheriff of Traquair, was directed to pass to the land adjoining the Gala and enquire how far according to its "new course" the Abbey and convent of Melrose were affected. It was not until 1337 that Galashiels is mentioned as a place where, after a great battle, the Scots lodged, while the English retreated over the Tweed. Tradition then mentions for the first time an alien plant in Scotland, and says that a party of the English army, suspecting no danger, straggled from the main body

and began to gather wild plums (*Prunus domestica*) that grew abundantly in that locality. While thus engaged they were surprised by the Scots, who fell upon them, giving no quarter, the bodies of the slain being thrown into a trench, the Eastlands, which still bears the name, "The Englishman's dyke." Hence the origin of the arms of Galashiels, which is a plum tree with two foxes. Some writers hold that the introduction of reynard is an anachronism, and that the arms should be simply a plum tree with the motto "Sour Plums." This formed the subject of a ballad, which is believed to have existed since 1632. Sir Walter Scott, in a reference to his uncle, mentions it in 1823, and it is spoken of later by Ruskin.

Gala House was not built till 1457, previous to which the Douglasses had a tower round which a few rude cottages were built. In 1467 a Beltane court was held, at which the King remitted certain fines. In 1503 the land formed part of the dower of Margaret Tudor, daughter of the English Henry the Seventh. By 1599 Galashiels was raised to the dignity of a Royal Burgh, with the right of holding a weekly Wednesday market and a yearly midsummer day fair. The Tolbooth was shortly afterwards built, and was first used as a place of worship. This building was demolished in 1880. In 1629 the passage up the glen was not easy to traverse, since no road had been made. The bed of the stream took its place, and in dry weather was used by those, principally horsemen, who wished to go north to the capital; and we learn that from setting out to reaching Herret's house, 8 miles away, the "Gallaw water" had to be crossed twenty times.

By the seventeenth century weavers were living in Galashiels, and some who declined to attend the Episcopalian service had to flee from the town. Their looms were confiscated, their dwellings despoiled, and heavy fines inflicted. Some recalcitrants took up arms, and, two of them being captured, were taken with 1200 other prisoners, in 1679, and crowded into the churchyard of Greyfriars, Edinburgh, and kept there nearly five months. Hall tells us that their only couches were the graves and their covering the sky, and that while some were induced to yield to authority, others preferred conscience and sacrifice to acquiescence in a system which they accounted unscriptural. Amongst the latter were numbered some of the prisoners from Galashiels. There were many other instances of appalling cruelty by the "bloody" Claverhouse, and heavy fines inflicted on the chief families in the district. Then followed a period of comparative calm, except such disturbance as was caused by the petty inquisitorial action of the Kirk Session.

Even at the end of the eighteenth century, despite its market, Galashiels was but a village. All the coals that came to it were brought on packhorses, the exigencies of the time not admitting of carts, although Hall does refer to the first cart wheel being made by Aimers, whose name still survives in the prosperous engineering business of the town to-day. In 1771, in addition to the weavers, there were ten persons employed as skimmers and tanners—industries also responsible for introducing some of the plants described in the

following pages. There were also forty artisans and fifteen licensed houses, a somewhat large proportion ; yet we are told "the people were sober and industrious in the extreme."

In 1801 Miss Wordsworth, who accompanied her brother, the poet, through Scotland, thus describes Galashiels :—"A pretty place it had once been, but a manufactory is established there, and a townish bustle and ugly stone houses are fast taking the place of the brown-roofed thatched cottages, of which a great number yet remain partly overshadowed by trees." In 1821 the place was still a small town of 1600 people, whose annual consumption of coal was 3000 tons ; the other imports did not exceed 2000 tons. The buildings were chiefly on the south bank of the Gala ; the Selkirk road was not in existence, so the Tweed had to be crossed by Yare bridge, forded at Needle Ha', or ferried at Boldside. About 1832 the population tended to decrease ; the sudden development of gold mining drew many to Australia, and Hogg, the Ettrick Shepherd, records, while he deplores the defection, that fifty-two inhabitants of Galashiels were thus leaving their native country. The railway was begun in 1847, and by 1850 the population had increased to 5,918 ; to-day it stands at 15,000. The increase in the population and the continued prosperity of the town depend entirely upon the wool industry.

In the industrial history of Britain the wool industry takes a leading place. In the early centuries it was of paramount importance. F. H. Bowman, D.Sc., to whom we are indebted for many details in this notice, traces, in his valuable work on "The Structure of the Wool Fibre," its origin from the Roman occupation, when spinning and weaving were introduced. Among the animals domesticated by man when he ceased to be merely the barbaric hunter, the sheep was among the first ; and long ere agriculture advanced to the tilling of the soil man grazed his flocks upon the herbs which a bountiful nature supplied. Even in the early lake and cave dwellings, among the debris of bones of slaughtered wild animals are those of the domesticated sheep, the flesh and fleece of which have been doubtless used for food and clothing.

The sheep, more indigenous to these hills of ours than we ourselves whose blood is mixed from many sources, was certainly native to Britain. From periods anterior to the Roman conquest flocks existed on the South Downs and the Cotswolds, and we have to peer into the remote past to find the time when sheep were not valued highly as the property of man. The opening chapters of Genesis, in which the segregation of labour is typified by Cain, the tiller of the ground, and Abel, the tender of herds—the former the more recent, linked to the soil, the latter immeasurably the older, chiefly nomadic—is a story of the seeking of pastures new, the telling of the flocks, the calling of the shepherd from the fold. The mountainous region of the south of Scotland, with its rivers and its valleys and its green-clad hills, was a natural home for the animal that is sung by the poet, sought by the painter, and has incidentally led to the proud position which Britain occupies among the industrial nations of the world.

This is certain, that as long ago as 1581 waulk mills, as they were called, existed on the Tweed; and in 1666, the date of the Great Fire of London, the weavers of Galashiels became incorporated. In 1777 we find the sheep emblazoned on the flag of the Manufacturers' Corporation, with its punning motto, "We dye to live and live to die." As early as the fourteenth century at Tweedside the wool was carded by hand and spun by means of the distaff; then the spinning-wheel was invented; rough handlooms came into use; but the great change took place in 1754, when Hargreaves and others invented the spinning-jenny, which revolutionised the industry. As water power has given place to steam, so is steam giving place to electricity.

Up to 1774 the wool used was all obtained from the immediate neighbourhood, the yarn being woven into blankets and cloth, styled "Galashiels greys," while the output did not exceed 722 stones. In 1782 about 43 looms existed in the village, while the yarn spinning employed about 240 women. In 1791 improved methods of spinning as well as of carding wool were introduced in the Wilderhaugh Mill, the first woollen factory in Scotland, and the cost of producing the yarn was reduced by 25 per cent. Each set of machines turned out from 48 to 72 lbs. in the day, and this provided employment in all the processes from wool to cloth for about 30 persons.

A journeyman dyer only received five pounds per annum, in addition to his board; the average wage of a weaver was 1s 7d per day: a journeyman clothier 4s a week and his board; while the price paid for weaving, including the winding and preparing of the yarn, was 2d to 3½d per yard. Child labour was largely used, and boys received 1s 8d per week, an annual suit of clothes and a bonnet for working 12 hours a day. About the end of the eighteenth century the quantity of wool used had risen to nearly 5000 stones.

About 1830 a great impetus was given to the industry; a new and better quality of cloth was made, and a special term employed to denote the material. This was the word "Tweed," which, it is said, was a misreading by James Locke of London of the word "tweel," then used in this connection; but the obvious local appropriateness of the term, together with its wide acceptance in the writings of Sir Walter Scott, the "Wizard of the North," has determined, whatever its derivation, that "Tweed" shall be the name for the product of the district. The first Tweeds were black and white checks; other patterns followed to suit the varied uses to which the cloth was put. In the early thirties came a demand for fine tartans for ladies' dresses, and this led in 1835 to an importation of German lambs' wool at 4s a pound. The introduction of this probably led to some adventitious plants being brought to the Tweed. By 1840, however, not only German but Australian wool had been brought to Tweedside. This arose from a demand for a finer and silkier material than that afforded by British sheep. It was found that this was yielded by the merino, a sheep at once the most valuable and common.

Most writers consider this animal, *Ovis hispanicus*, to have been brought by the Moors into Spain from Northern Africa; but it seems

probable that it deserves its scientific name since in Roman times the Spanish wool was so excellent in quality as to be in great demand. This was much anterior to the conquest of Galicia by the Moors in 734; and it may well be that this clever people brought over some sheep from Africa and crossed the native Spanish sheep to improve the breed, for the Spanish sheep have many varieties. One of them, and that the best, is a migratory Merino, Transhumantes, which, as its name suggests, is driven by shepherds from the uplands to the lowlands in winter, and from the plains to the mountains in the summer. The name Merino is not taken from a place but from the Spanish name given to the officials who examine the sheep pastures in Spain, a very numerous class in that country. Whether of Moorish origin or not, the merino was a valued possession of Spain, and during the Moorish occupation for over six hundred years the wool of that country not only was of excellent quality but its manufacture was extensive. The expulsion of the Moors after the victory of Ferdinand and Isabella led to a decadence of its industry, and for the next two hundred years the Spaniards were more engaged in fleecing the South American peoples than increasing the output of wool. The Merinos, however, were always greatly valued, and were exported under the greatest restrictions, disobedience being visited with the death penalty. The ram of this breed has horns, the ewe is hornless; the wool is in the main white or light-coloured, and has the desirable qualities of fineness, lustre, great strength of fibre and unrivalled felting properties. In 1765 the Elector introduced the Merino into Saxony, and this led to its being extensively bred. From this source came the first consignment to Tweedside. In Austria another variety of Merino was introduced about the same period, and forms the Negretti race. Both this and the Saxon, although derived from the Merino, are quite distinctive. It is a curious coincidence that the highest order which the ruler of Spain or Austria can bestow upon a subject or a fellow monarch is the Collar of the Golden Fleece. The historic collar, which belonged to the great Emperor of Germany, Charles the Fifth, was given to the Duke of Wellington, and now forms one of the many treasures of Apsley House. Gifts of Merino sheep were made by the King of Spain not only to Austria and Saxony but also to the Dutch Governor of South Africa and to George the Third of England.

Australia is the greatest wool producing country in the world. The island continent in 1912 supplied 44 per cent. of the world's wool. The inception of this great industry goes back to 1788, when the first governor, Captain Phillips,* in 1788 took out 29 sheep from England. In twelve years there were over 6000. The British sheep, accustomed to a northern climate and its vagaries, while thriving in this dry land

*Governor Phillips not only took sheep but cereals. At Rio and the Cape he collected many economic plants, and set apart land for a farm and garden. This is the site of the present Botanic Garden at Sydney, where the impress of the once ploughed fields of cereals is still left. The colony was founded on January 26th, 1788.

of sunshine, was not the best breed for continued success; and Captain John MacArthur had the prescience to see that better results might be obtained by crossing with sheep indigenous to a more tropical country. He therefore made the long sailing voyage to the Cape, bought from the Governor three Merino rams; he got some ewes in India, and eventually established a good medium flock. He continued his experiments in stock-raising as well as in grazing, finding soil in close proximity to the sea unsuitable for the Merino. In 1807 a bale of wool from his estate was sold at 10s 6d a pound, and a cloth coat for George the Third was made from it. Throughout the century Australian and New Zealand sheep-raising has so prospered that the national income for the most part must be derived from the wool and frozen mutton that is exported to more thickly populated lands. In the present investigation it is important to note that not only the abundance of the product but its quality determine the source of much of the raw material used in the mills of Galashiels, and incidentally the nature of the adventitious plants to be recorded.

Again, the Merino sheep was early introduced into France from Spain, and there a breed known as the Rambouillet, after a village near Paris, was developed and afforded an excellent wool. The Spanish took the Merino to the conquered states in South America, whence they were introduced to North America, where a somewhat celebrated flock, the Vermont, was educed. But wool is obtained from other countries and other species. From the flat-tailed sheep of Western and Central Asia comes a coarse, much tangled wool. Abyssinian wool, though deficient in quality, is of fine lustre; India produces many varieties, from the magnificent mountain species as well as from the goat-like creature of the plains. The Cape still affords the Merino, and a large supply of wool, valued in 1915 at £5,350,031, came from that area. Mohair is also exported from the Angolese sheep. In 1911 16,303,378 pounds were produced, and the exported value in 1914 was £834,202. Uruguay has 26 and Chile $4\frac{1}{2}$ millions of sheep. Of the European countries, Spain has about $13\frac{1}{2}$, France $17\frac{3}{4}$, Italy about 7, Germany 8, Hungary $8\frac{1}{2}$ (1911), Great Britain (1914) nearly 28 millions. In 1915 we imported 1,179,000,000 lbs., and of this we retained for home consumption 1,001,000,000 lbs. The immense plains which abound on the Atlantic coast of South America form one of the best feeding grounds in the world, and some of the finest wool is now exported from the River Plate. The Argentine itself is the second largest producer of wool in the world, but the west coast, Chile, Peru, and Bolivia also are great wool-producing countries. The Falkland Islands, with their wet and windy climate, now carry many sheep. A friend of the writer, the late laird of Canna, told him of his early struggles to establish sheep in those remote islands. One after another of the various flocks he took out succumbed to the fluke, a parasitic worm encysted in a snail, which is swallowed in grazing, and, undergoing a change in the warmth of the stomach, makes its way into the liver of the animal and brings about its death. This continued until the Romney Marsh sheep from

Kent proved immune and repaid him for his loss and trouble. Prior to the introduction of sheep into the Falkland group the life cycle of such parasites was probably completed in the intestinal tracts of birds. South America has also nearly five millions of Alpaca and Vicuna.

Of these markets here mentioned Britain has taken advantage, so that to-day she draws upon the whole world for her supplies of wool, and of this more than half comes from our own possessions and from such widely different sources as Australia, New Zealand, the Cape, Eastern Africa, the Falkland Islands, the various countries of South America, the Russian pastures and the Siberian Steppes, from semi-tropical Indian plains, from North Africa, Abyssinia, Persia and Afghanistan. Galashiels soon took advantage of other markets besides the German and Australian. New Zealand, the Cape and South America quickly followed, and now she draws upon the world for her supplies. These lands, therefore, are the sources of the various adventitious plants which form the subject of our present study.

Ere we look at that subject in detail, however, it may be instructive to consider the mill processes which are the direct cause of the distribution of these plants on the Tweedside. When uncleansed—that is, greasy—wool is delivered to the mill it is spoken of as “in the grease.” This alludes to the natural fatty secretion which is plentifully given off by the skin and serves to keep the wool soft. This, together with the close texture of the wool itself, enables seeds and fruits to adhere to or become entangled in the fleece. Although this is detrimental to the wool it has had a most remarkable effect upon plant distribution throughout the world. The most casual observer must have noticed that the wool of the sheep is often dirty and harbours not only living creatures but seeds, burrs, branches of briar and other refuse, and he need not look far to see the cause. In feeding the fleece comes in contact with herbaceous plants, bushes, etc.; portions of the plant break off, and the fruits and seeds and debris stick to the fleece. When the sheep lies down its weight and movement press into the wool the various plants which have formed the animal’s temporary bed. As it moves about some seeds become dislodged and are dropped at a distance from the parent plant. This is one of the ways in which the daisy-spangled meadow or the pasture with its golden glory of yellow buttercups is produced. The altitudinal as well as the geographical range of plant life is doubtless slowly changed by the same means. Thus knowledge, based on something more than mere supposition regarding the distribution of the Spanish *Medicagos* and *Erodiums* which have spread over the Argentina pampas in the new world and the grassy areas of the Australian Continent has been singularly amplified by their appearance in the old world in Tweedside.

Now to prepare this “wool in grease” for yarn the grit and burrs have to be removed. The most troublesome is the burr, for, while other extraneous matter may be got rid of by scouring, the burrs, covered as they are with prickles more or less hooked, are not readily released from the wool. The ingenuity of the trade has been severely taxed. As much as £60,000 has been paid to a French Syndicate for

a process of burring. The burrs commonly found are the fruits of *Medicago*; the prickly spined Bathurst Burr, *Xanthium spinosum*; the Woolgara burr, *X. strumarium*, and the New Zealand *Acaena*, the prickly fruits of which give a red stain to the wool. They are usually got rid of in the following manner. In the first stage, the wool, having been sorted into various qualities, is put into long troughs filled with a hot solution (110-120° F.) of soap and alkali, through which it is mechanically moved till cleansed from vegetable and other waste matter. The alkali combines with the grease to make a soapy fluid which assists in cleansing the wool. The small seeds of *Lepidium* and fruits of Compositae, such as *Cotula* and *Senecio*, are thus detached and carried off in solution. The wool then receives a thorough washing in warm water to remove the dirty soapy solution in which it is soaked.

The second stage reserved for the "burry" wool consists in passing it through a trough of sulphuric acid and water (8° to 12°, Twaddell), and thereafter it is dried and placed in a receptacle, where it is subjected to a dry heat of 180° F. It is at this point that the burrs, which have absorbed much of the sulphuric acid, are charred, or, to use the technical term, "carbonised." This drastic process does not seriously damage the properties of the wool, but makes the coating of the pods with their spring attachments friable. The next stage consists in passing the burry wool between heavy steam rollers, which crush the friable pods. The debris, together with the seeds too small to be crushed, are winnowed away, and the wool is then ready for carding in its natural colour or for placing in the dyer's vat.

It might well be thought that the process described would destroy any vitality the seeds might have retained after their long journey; in fact their power of germination has been seriously questioned. To test this Mr Sanderson of Galashiels had some of the debris of this carbonisation, a coarse dark chocolate powder in which the seeds are plainly visible, planted in sterilised soil, with the result that a plentiful crop of *Medicagos* resulted. Not only so, but seeds which have actually passed through the boiling dye vats have produced living plants. Experiments have been made on the temperature-resisting power of a plant embryo, with startling results. The seeds of the pea, the melon, wheat, barley, and maize may be quoted. These seeds, carefully dried, were put into hydrogen, which was subsequently liquified, and, after being thus immersed for some hours in a temperature within a few degrees of absolute zero, the cold of that "interstellar space where never forms a cloud or moves a wind," they were taken out and sown, and the plants grew and developed. Similarly seeds of pea, bean, wheat, etc., were placed in bottles of pure dry chlorine, nitrogen, and other gasses for two years, and yet were able to germinate. Thus, while the embryo is quiescent, extremes of heat and cold do not destroy vitality, but if warmth and moisture start germination, it becomes very susceptible to extremes in temperature and to atmospheric conditions.

As will be gathered from this very brief description of the cleansing process, one of the requisites for a woollen factory is a

copious supply of water. This the Tweedside affords. Formerly many of the effluents passed directly, with other vegetable and animal refuse, into the once pellucid Tweed and Gala. In these quickly moving waters the seeds and fruits of many a strange and unexpected species were carried down to the Gala foot, where a delta like bed of shingle appears at the meeting of the waters, and forms an anchorage for many seeds from Selkirk and Galashiels. Others are carried still further down the Tweed till some eddy enables them to obtain a precarious tenure on the banks. Such is the home of most of the species enumerated in the following pages.

Some suburban botanists have scoffed at the inexhaustible rubbish-heaps of Tweedside, possibly having in mind their own juvenile researches for botanical laurels in the ash-pits and garbage-heaps of the metropolitan area. But this is one of the most beautiful districts in Scotland, and even the shingle strand, the new habitat for strange plants, is by no means without its scenic charms. (See frontispiece.) The Tweed, the oft-sung river of the Borders, at this point even in these days runs full and sweet over many a willow-shaded shingle bar, by banks rich with nature's profusion of bush and tree, the dark-red wild roses (the *villosa*, *mollissima* and *cristata* series), the hawthorn white and the purple-berried elder. To the south are the distant volcanic formations, the Eildons, and nearer still Cauldshiels and Whitelaw across the Tweed from Abbotsford, upon whose undecked brow Sir Walter himself has planted many a tree; to the east are the Roxburgh Cliffs near Langlee, wooded from base to summit with rasps and ragwort. Recently the municipality of Galashiels has erected a well-fitted sewage station, and while the amenities of the river have gained, almost the entire source of adventitious plants has been cut off. Even if a few escaped the sewage tanks and filter beds they could scarcely survive for germination the long immersion in highly nitrogenous and fermenting solutions. It must not, however, be assumed that all the wool aliens will disappear. A copious supply has been afforded hitherto in the vicinity of the various works, but their occurrence is very precarious, as the heaps of refuse, which are largely mechanically removed dust and burrs, are only temporary.

Allusion has been made to the resisting power of seeds in the drastic treatment they undergo in the burring process; indeed, some species such as the *Chenopodiums* and *Lepidium* appear to thrive on it. Now, in the skin-works they are subject not to a dry but to a damp heat. This, however, in many species only stimulates germination. The wet skins are hung in dark rooms when a stage in decomposition sets in, ammonia is given off, the temperature rises from normal to 70 or even 90 degrees, the roots of the wool are loosened, and it becomes easily detached and removed with the adhering seeds. Among the latter is the semi-tropical *Bidens pilosa*, which Miss Hayward has repeatedly tested by growing the needle-like fruits. These plants are very abundant on both rivers extending on the Tweed for nine or ten miles, but they are too tender to fruit.

It must not, however, be assumed that all the species of seeds

which occur in wool germinate on the Tweed. Probably those that do occur are a very small percentage. Compared with the adventitious plants of Montpellier, the absence of so many Leguminous, Labiate, and other species of the Mediterranean region at once becomes apparent. It may be that these species succumb to the methods of the inquisition in the burring process, or the moist shingle, perhaps loaded with an excess of nitrogenous matter from the "good old days," may be unsuitable for some though helpful to others. Most probably they miss the sunlight and warmth of their southern home. Miss Hayward has ascertained that among other species* the Woolgara Burr does occur in the wool. This plant, perhaps originally a native of central Asia, has followed in the footsteps of man or his dependants throughout the world. It is a pest in Australia; yet hitherto no single seedling has been observed on Tweedside. In 1597 Gerard noticed it by the wayside near Uxbridge, in Middlesex, where the writer has seen it in the twentieth century. Its congener, *spinosum*, the Bathurst burr, is abundant on Tweedside. In the following pages, however, only those species are recorded which have naturally passed into the river or germinated in the adjacent mill refuse. Of these the most remarkable are a handsome yellow *Senecio* (*S. lautus*) from Australia, which actually seeds in the area; the Australian Dock, *Rumex Brownii*, named after that most distinguished botanist, Robert Brown, who was one of the first to make known the glories of the Australian flora; and the Australian *Erodium cygnorum*, appropriately enough named

* The following are among the seeds found in the wool by Miss Hayward, the initials signifying the country of their origin, i.e., N.S.W.—New South Wales, N.Z.—New Zealand, Q.—Queensland, V.—Victoria, W.A.—West Australia:—*Erodium* sp., all; *Medicago denticulata*, N.S.W., Q., V., W.A.; *M. apiculata*, N.S.W.; *M. minima* N.S.W., V., W.A.; *Melilotus* sp., Q., V.; *Trifolium* sp., N.Z.; *T. arvense*, N.S.W.; *Acaena*, sp., V.; *A. anserinifolia*, N.Z.; *Daucus* sp., N.S.W., V.; *Caucalis* sp., N.S.W., V., Q.; *Galium Aparine*, N.Z.; *Bidens pilosa*, all; *Xanthium spinosum*, Q., N.S.W., V.; *X. strumarium*, V.; *Carduus* sp., N.S.W.; *Centaurea* sp., N.Z.; *C. melitensis*, Q., N.S.W., W.A.; *C. Solstitialis*, V.; *Millotia* sp., W.A.; *Calotis* sp., V.; *C. hispidula*, N.S.W., W.A.; *C. cuneifolia*, N.S.W., W.A.; *Helianthus* sp., N.S.W.; *Hypochoeris glabra*, W.A., N.Z.; *Datura* sp., Q.; *Lamium* sp., N.S.W.; *Rumex* sp., N.S.W.; *R. Brownii*, Q., V.; *Polygonum* sp., V.; *Juncus* sp., N.Z.; *Carex* sp., N.Z.; *Setaria* sp., Q.; *Sorghum* sp., N.Z.; *Andropogon* sp., Q.; *Phalaris canariensis*, Q.; *Aira* sp., N.Z.; *Avena* sp., N.S.W., Q., V., W.A.; *Molinia caerulea*, N.S.W., W.A.; *Festuca* sp., Q.; *F. bromoides*, N.Z.; *Bromus* sp., N.S.W.; *B. sterilis*, W.A.; *Triticum* sp., N.S.W.; *Hordeum* sp., W.A.; *H. vulgare*, N.S.W.; *H. marinum*, Q.; *Equisetum* sp., Q., and the fronds of *Pteris aquilina*, var. *esculenta*. *Bidens pilosa* and *Datura Stramonium* are abundant in Cape wool. Necessarily the list is by no means exhaustive, and is only the result of a few examinations. The following dead beetles have also been found in the wool by Miss Hayward, and we have to thank Mr J. N. Halbert, National Museum, Dublin, for kindly determining them:—*Anthia homoplata*, South Africa; *Diloboderus abderus* male, Argentina; *Julodis algerica*, N. Africa; *Scarabaeus pnis*, Mediterranean, N. Africa, S.-E. Europe, N. Asia; *Copris hispanus*, S. Europe; *Copris* sp., *Canthidium* sp., Tropical America; *Dermestes vulpinus*, cosmopolitan; *Scitula* sp., Australia; *Psectrascelis laevigata* and *Pilobalia decorata*, Bolivia, Chile, Peru; *Morica planata*, S. Spain, Algeria, etc.; *Blaps pinguis*, Morocco; *Chiasognathus Granti*, male, and *Blattia* sp., Chile.

from the swan, which may allude to the emblem of Western Australia, and one of the first Antipodean plants to appear. These are examples of plants naturalised in Britain from that far distant Commonwealth, a fact unknown to its botanists at the time of the visit to the British Association in 1914. In addition to these at least one species of the New Zealand rosaceous genus *Acaena* now extends for many miles down the Tweed.

But the number of adventitious plants on the Tweedside is great, and the problems of their occurrence in such an unusual station interesting. A few, as we have said, may become permanent members of our flora, but the great mass are purely ephemeral. These "nurselings of another sky" have but a fleeting existence. The rigours of a Scottish winter and the even more trying northern spring kill many, while others are mechanically removed by frequent and tempestuous floods, to which the streams are subject. The soil is often washed away, together with the plant, and the latter finds its grave under a heap of shingle and sand. A single visit to this area will enable the botanist to see only a very few of the species enumerated, for the list is the outcome of many years' observation. Some species*, it is true, such as *Bidens pilosa*, appear from year to year, yet it is certain that these are annually reinforced, and not simply by the seedlings of previously existing Tweedside plants. Again, no two years exhibit identical species; each year offers something exceptional. Summer floods and cold autumns cause a paucity of species; a drier summer and a warm September induce a number of Cape and Australian composites to flower and produce seed. Even in its rival, Montpellier, the same fugitive characteristic in alien species has been observed. Montpellier has an even richer adventitious flora, numbering in all about 800 species. The striking feature in its vegetation was closely studied by the eminent M. Godron, the joint author with M. Grenier of a most excellent *Flore de France*. As early as 1853 he published a *Florula Juvenalis*, and a second edition in 1854, which contained 386 species, 57 being new to science. It was so named from Port Juvenal, an enclosure on the Lex Canal close to Montpellier, where wool, mainly imported from the Mediterranean district, had been unloaded at least as far back as 1700. There the wool for cloth factories was passed through a hot bath, washed in the river, and then spread out on gravel beds and divided into yards by stakes and sheets of coarse linen.

* Not only have Australian and Cape plants come to Scotland, but the influence of the British flora on that of Australia and New Zealand is enormous. Plants, too, from the Cape have spread with marvellous rapidity to Australia. *Cryptostemma Calendula* has already been mentioned. Those of American origin, now pests in Australia, include *Argemone mexicana*, *Verbena bonariense*, *Modiola caroliniana*, *Eriogon canadensis*, and species of *Opuntia*. From Europe, among others, come the Stink Aster, *Inula graveolens*, now covering large areas; *Medicago*, *Melilotus*; *Centaurea Calcitrapa*, the Star Thistle; *C. melitensis*, known as Cockspur; *C. Solstitialis*, *Anthemis Cotula*, *Lithospermum arvense*, Sheep-weed; *Datura Tatula*, and *Hordeum murinum*. The awns of the last mechanically pierce through the skin and enter the internal organs of sheep and cattle (see Fig. 77).

ADVENTIVE FLORA OF TWEEDSIDE.

The ground was naturally kept damp, and this, in connection with the high temperature of a southern climate, favoured the germination of the numerous seeds brought in with the wool. The process of washing, which involved plucking and passage through tourniquets placed in the river, must have reduced their number very much, whilst the treatment which the alien vegetation experienced during its development, the repeated weeding, exposure to cloth much impregnated with sulphur vapour, which was often spread over the wool, the keen competition of indigenous weeds were very unfavourable to their permanent establishment.

"But we must not imagine those drying yards as a botanic garden of exotics, as they have sometimes been called, but a casual nursery bed, where those alien plants would come and go, so that only a limited number were seen together at a given time. Long continued observation and much perseverance were required to collect the material for a florula of the place. It was mainly due to the indefatigable zeal of M. Touchy that Godron was enabled to write his work" (Stapf in *Kew Bulletin* 206, 1917). Montpellier also has an historic Botanic garden, founded in 1598, from which many species have escaped. The history of the adventitious species of the district has been traced in the monumental work, *La Flore Adventice de Montpellier*, of Dr Albert Thellung of Zürich, published in 1912, where he enumerates about 800 species, of which 148 are said to be intentionally introduced, many being ornamental plants. Foreign grain accounted for about 40 species, and over 20 occur about flour mills, while wool aliens amount to 526 species. Ballast is responsible for 19 species, railways and navigation for 18 species. About 31 hybrids have been produced in the area. Dr Thellung estimates that the aboriginal flora is about 2100.

The geographical sources of the wool-aliens of Montpellier and Tweedside are as follows:—

	Montpellier.	Tweedside.
Mediterranean,	416	113 (including British)
E. Europe and Western Asia, ...	17	48 (E. and C. Eur.)
Asia, Central, North and East,	2	14
Africa, South,	6	43
Australasia, Oceanic,	5	51
America—North,	4	23
Tropical,	11	8
South,	49	43
Unknown,	16	5
	<hr/> 526	<hr/> 348

Montpellier has, other than European and Western Asian, 93 species; Tweedside, 186 species. It must also be borne in mind that a large number of Tweedside plants reckoned as European in the above census actually have been introduced from extra-European places—e.g., *Medicago hispida*, classed as Mediterranean, comes chiefly in Australian wool; *Silene gallica*, classed as Mediterranean, is probably

from South African wool ; and *Erodium Botrys* (Mediterranean) comes in Australian and Cape fleeces.

The drying yards at Port Juvenal were given up about 1880, and as late as 1905 Dr Thellung was only able to find 10, mostly perennial species, which survived in the struggle with different conditions of soil and climate and against the competition of indigenous vegetation, thus proving their evanescent character even under better conditions than are offered by the climate of Scotland. A comparison between the geographical sources of the Montpellier and Galashiels strangers at once shows that the Scottish plants have been drawn from a far wider area. Had the Mediterranean species present in the wool been able to withstand the damp and cold of Tweedside the northern habitat would have had an overwhelming preponderance in numbers. Montpellier has drawn many of its wool aliens from the limited area of the Mediterranean, while plants whose homes are thousands of miles away make up the bulk of the Tweedside adventitious flora. Doubtless the protective duties of the French port limited the quantity of wool which came in from other than French possessions, hence the vast preponderance of Algerian, Tunisian, Moroccan, and other Mediterranean wool, but in Galashiels there was no such protective selection, and the world's wool produce was treated without discrimination. Of course, if continental countries confined themselves for the most part to Mediterranean wool there would be little left for Britain. In any case she receives much from our own possessions and from the republics of South America, and these are the chief sources of the wool that reaches Galashiels. As a matter of fact, some quantity of Australian, Cape, and South American wool is scoured in Mazamet and Montpellier for Tweedside, and so arrives there largely denuded of seeds, but practically no native Mediterranean wool, except possibly a little Spanish, ever reaches the Border.

As one investigates the subject more closely it is an extraordinary chapter in plant history that is unrolled even as one stands within sight of Melrose or Abbotsford. One sees visions of many a distant port and the ships lading their wool cargoes; the magnificent entrance to Cape Town dominated by Table Mountain, an outpost of the illimitable veldt spangled with bright Composites, *Helichrysum*, tiny *Cotula* and discoid *Matricarias*; the busy Rue de Cannabière, itself named from the Alien Hemp, leading to La Joliette, whence sailed Massilia's triremes, and to which came the early Phœnician voyagers. *Erechtites* speaks of the serene but glorious beauty of Sydney, with its long harbour sheds of fleeces; the cress, *Lepidium bonariense*, of the unsurpassable charm of Rio with its palm avenues, quaint Corcovado Mountain, and the wealth of tropical background; while *Bidens pilosa* brings memories of Madeiran barrancas, Cinghalese jungles and Trinidad savannahs. The botanist who goes down to the sea in ships and visits many lands has his imagination stimulated again and again in after years by the sight at home of a lonely alien visitor that speaks of steppe and prairie, of bluff and nullah far across the main. Britain has drawn upon the universe for her supplies and in turn

sends her products to the outposts of the world until her commercial prosperity is one of the wonders of the age. The argosies of a far wider world than Dido knew bring the fleece from distant lands to the busy townships by the rivers in the island home in the northern seas.

Men do not see the glory in the grey, the wonder in the commonplace, the poetry in their commerce, the beauty amidst their toil, but here is a plant romance just at their door. The Burr Medicago, discarded as a nuisance, has travelled far and seen many lands. From the wool of the Spanish sheep taken to Peru, Brazil, or Argentina it is shaken out on some dry Pampas, and thrives with a luxuriance unknown in its European home. It travels southward to Chile or northward to California, and its descendants two centuries later come to Scotland and germinate by the Tweed. So, too, the Mediterranean *Erodiums* were introduced. These probably went out with the kingly present of Spanish sheep to the Cape in the eighteenth century, as well as to Australia at the beginning of the nineteenth, in the early efforts to find the most suitable stock for a semi-tropical land. The writer never sees them on Tweedside without recalling his drive of some hundreds of miles through South Australia and Victoria, where, in the vicinity of the Murray River, he passed over millions. The rolling surface and dry short pasturage there reminded him of the Spanish Sierra Guadarrama. They were to be seen growing with the native species, the *Calotis*, and other flowers in recently cleared ground, in some cases adjacent to Mallee scrub, or shaded by graceful Eucalyptus. In the vegetable and animal world the intruders had nearly ousted the original occupants, and the abundance of the *Erodiums* accounts for their prevalence on Tweedside.

Miss Hayward found at Selkirk *Nassella flaccidula*, a very rare species of beautiful feather grass, only occurring over 13,000 feet up the Bolivian Andes on the mountain slopes near La Paz. Its seeds had managed to fix themselves in the fleece of some adventurous sheep and, despite the shearing, the jolting down the mountain railway to Antofagasta, the long sea voyage round the Horn, across the Line, it finally germinated on the Tweed at less than 400 feet above the sea level. In its new home, too, it grew not as the type but as a variety, new to science, which Professor Hackel named *glomerata*, not as yet discovered in South America. Another species, *Nassella caespitosa*, which is known from Salta in Western Argentina and Chicha in the Peruvian Andes, was also found. Close to them grew two or three species of *Danthonia* from New Zealand and *Polypogon maritimus* from some Mediterranean or Indian source.

The shingle at Galafoot has afforded Miss Hayward some very curious species, among them one which was only in leaf last September, but the sight of it made the memory leap to the dry dusty roadsides of Adelaide, where it is known as the Cape Weed, *Cryptostemma Calendula*, with its unmistakable leaves and marigold-like flowers, hence the name *Calendula*. This was taken out by sheep from the Cape to Australia, and there it covers thousands of acres with its golden blossoms, and is again and again brought not only to Galashiels

but to Yorkshire wool centres. The sheep roll on the inflorescence and retain the fruit in the sticky fleece, where it remains through all sorts of vicissitudes, and is eventually carried on its long sea journey round its old home, the Cape, and across the Line, to be landed in the sombre Thames, to be rattled northward by rail, to pass through the various processes in the factory, and finally to germinate in the cold wet shingle of a Scottish stream, under a comparatively sunless sky, alongside the Canadian *Erigeron*, an Australian *Eritrichium*, a South American *Lepidium*, a North American *Aster*, and a British Dandelion. Here, too, has been found a very tiny member of a small genus of four or five species of an Australian Composite called *Millotia*, which, not agreeing with any already known, Dr Stapf has described and named *Millotia depauperata*. It still awaits discovery in Australia.

Many of these adventitious plants have what is termed highly specialised fruits or seeds armed with straight, sharp or hooked prickles, or spines or barbed hairs, such as the Burr already mentioned, the *Erodium*, *Hordeum murinum*, *Centaurea* and *Carthamus*. These are plentifully represented on Tweedside. Without such armature are two of the most prolific genera on the Tweed, *Lepidium* and *Chenopodium*. These must rely upon the easily dehiscent fruit and the smallness and abundance of their seeds which readily adhere to the greasy wool.

Lepidium is widely represented not only in Europe but in South Africa, America and Australia, and Miss Hayward has been enabled to add to the British list representatives from each continent. One of these, *Lepidium pseudo-didymum*, is new to science, and is presumably from South America, but as yet no botanist has found it on that continent. *Lepidium oxytrichum* is an Australian example. *Lepidium Schinzii*, an African species, was found on the Tweed as long ago as 1878, but British botanists at that time mistook it for *L. ruderale* or *L. lacerum*. The goosefoots, *Chenopodium*, are among the most numerous represented plants, both as species and varieties, on Tweedside. They are intimately connected with man and his operations, and thus they become well nigh ubiquitous over the civilised world. Here, too, as in Port Juvenal, natural hybrids occur. Professor Romanes once formulated a hypothesis that "closely allied species occupying similar areas were mutually infertile." It contained, doubtless, a germ of truth, but the hybrids of *Geum rivale* and *urbanum*, of *Linaria repens* and *vulgaris*, among many others, negative this theory. Hybrids between our British *Chenopodiums* are either rare or are passed by unrecognised, and the same is true of *Sonchus oleraceus* and *asper*. Yet, speaking of the latter, Sir Joseph Hooker says that in New Zealand, where they have been introduced, such intermediates occur. It is only quite recently that, after much searching, the writer has detected such a hybrid in Britain, and that in highly nitrogenous garden soil. So too, on the Tweed, the Indian species, *Chenopodium striatum*, not necessarily directly from India, and the American *Chenopodium hircinum*, have hybridised and produced a beautiful cross which was discovered by Miss Hayward and named

Chenopodium Haywardiae in her honour by that indefatigable worker at the genus, Dr Murr. Several other *Chenopodiums*, brought to an uncongenial habitat, at least to one essentially different to their native home, form on the Tweedside all kinds of irregular alliances, and yield a most variable and perplexing progeny in their anxiety that the individual should not perish. The extraordinary plant-occurrences on Tweedside demonstrate the mutual interdependence not only of individuals but of industries and communities. They show how peace and peaceful competition have won victories greater than those achieved by war. They reveal the changes taking place in the plant world by varying and unsuspected agencies, and lay bare the marvellous beauty of an industrious activity ever modifying to meet new conditions.

Revolutionary changes have taken place during the last century, but no greater change has come to further the labours of men than the use of steam and electricity, rendering possible the conquest of the air, so that the Atlantic has been crossed in sixteen hours, and a wireless message has been received at Devizes direct from Honolulu. The world has shrunk in size, and Australia is to-day nearer to London than were the Outer Hebrides in the days of old. Who could have predicted a century ago that the raw material for our clothing would in great part be obtained from a country of which only a strip of coast line was then explored, but which is to-day the greatest wool-producing country in the world, whose sons have marched to the aid of the mother country and laid down their lives with men of veldt and corn-land, of rubber forest and paddy-field for their companions? And in a wonderful way to the shingle-beds of the Tweed have the ends of the earth sent their colonists, emphasising the federation of the nations and the pride of the motherland. It is the epitome of centuries of the world's discovery, invention, exploration and conquest over the realm of nature.

PLAN OF THE FLORA.

The plants are arranged in the sequence of Druce's *List of British Plants*, which is based on the limitations and sequence of the genera of Bentham & Hooker's *Genera Plantarum*, as modified in Durand's *Index* to that work. In the *List* the sequence of species in Nyman's *Conspectus Florae Europaeae* is in the main adopted. A short description of each Family and Genus is given with the derivation of the name. Under this come the scientific name of the species, and, where in use, the popular name. The more important synonyms are also cited. References to published plates of the species are inserted when possible. Then follows the distribution of the species over the world. This cannot be exhaustive, but it is trusted a general idea is conveyed. The species is briefly described, and its first record on Tweedside follows. Details are supplied by Miss Hayward of its local occurrence and also of the flowering period.

ABBREVIATIONS.

The less obvious abbreviations are as follows :—

- A. & G.—Ascherson and Graebner.
 Ann. Scot. Nat. Hist.—Annals of Scottish Natural History, edited by
 Prof. Trail, F.R.S.
 B. & H.—Genera Plantarum, G. Bentham and J. D. Hooker.
 Benth. Fl. Austral.—Flora Australiensis, G. Bentham.
 DC.—De Candolle.
 D. T.—Genera Siphonogamarum, C. G. de Dalla Torre and H. Harms.
 Dur.—Index to the Genera Plantarum, T. Durand.
 Farquharson.—List of Flowering Plants and Ferns found in Selkirk-
 shire, Rev. James Farquharson in the Proceedings of the
 Berwickshire Naturalists' Club, 1876.
 G. C. D.—George Claridge Druce.
 Hist. Berw.—History of the Berwickshire Field Club.
 I. K. or Ind. Kew.—Index Kewensis.
 I. M. H.—Ida M. Hayward.
 Johnston Fl.—A Flora of Berwick-on-Tweed, George Johnston, 1829-
 1831.
 Johnston, N. H.—The Natural History of the Eastern Borders,
 George Johnston, 1853.
 L.—Linnaeus.
 Nym. Consp.—Conspectus Florae Europaeae and Supplements, C. F.
 Nyman.
 Proc. Berw.—Proceedings of the Berwickshire Naturalists' Club.
 Reichb. Ic.—Icones Florae Germanicae et Helveticae, H. G. L. & H.
 G. Reichenbach.
 Rep. B.E.C.—Reports of the Botanical Society and Exchange Club of
 the British Isles.
 Rep. Bot. Rec. Club.—Reports of the Botanical Record Club.
 Stuart.—G. C. A. Stuart in the Proceedings of the Berwickshire
 Naturalists' Club.
 Thell.—Dr Albert Thellung.
 Tr. Bot. Soc. Edin.—Transactions of the Botanical Society of Edinburgh.

LIST OF THE PRINCIPAL BOOKS AND AUTHORITIES CITED.

- Ascherson, P. & Graebner, P.*—Synopsis der Mittel-Europaischen Flora, 1896 →
- Bailey, F. M.*—Synopsis of the Queensland Flora, 1883.
- Battandier, J. A. & Trabut, L.*—Flore de l'Algérie, 1888-1897.
- Bentham, G.*—Flora Australiensis, 7 vols., 1863-1878.
- Bentham, G. & Hooker, J. D.*—Genera Plantarum, 1862-1883.
- Boissier, G.*—Flora Orientalis, 6 vols., 1867-1888.
- British Association Publication of the Australian Commonwealth on the Visit of 1914.*
- Britton, N. L. & Brown, A.*—Illustrated Flora of the Northern United States, Canada, and the British Possessions, 3 vols., 1896-1898.
- Bowman, F. H.*—Structure of the Wool Fibre, 1908.
- Brotherston, Andrew*—On *Poa sudetica* as a British Plant in *Proc. Berw.* 129, 1873; List of Tweedside Plants, mostly of Recent Introduction, in Catalogue of Phanerogams and Ferns in Peebles, in *Rep. Bot. Rec. Club*, 1879.
- Cheeseman, T. F.*—Manual of the New Zealand Flora, 1906.
- Coulter, J. M.*—Flora of the Rocky Mountains, 1885.
- Dalla Torre, C. G. & Harms, H.*—Genera Siphonogamarum, 2 vols., 1900-1906.
- De Candolle, A. P.*—Regni Vegetabilis Systema Naturale, 1818-1821; Prodromus, 1824-1873.
- Druce, George Claridge*—Plants of Roxburgh, Haddington, and Berwick in *Ann. Scot. Nat. Hist.*, 239-241, 1905; Notes on the Flora of Berwickshire, *l.c.*, 96-101, 1907; Scottish Plants, chiefly from Skye, Peebles, Selkirk, and Kirkcudbright, *l.c.*, 96-99 and 164-174, 1911; Plants of some Southern Scottish Counties, *l.c.*, 39-43 and 95-102, 1910; Notes on Scottish Plants in *Tr. Bot. Soc. Edin.* 147, 1912.
- Evans, A. H.*—Notes on the Plants found in the District worked by the Berwickshire Naturalists' Club in *Proc. Berw.* 221-235, 1916.
- Farquharson, Rev. James*—List of Flowering Plants and Ferns found in Selkirkshire in *Proc. Berw.* viii. 77, 1876.
- Fraser, James*—Alien Plants in *Ann. Scot. Nat. Hist.* 99-102, 1911; *Tr. Bot. Soc. Edin.* 191, 1911-1912; and *Scottish Botanical Review* 39-41, 1912; Notes on Some Scottish Plants in *Tr. Bot. Soc. Edin.* 234, 1914.

- Grisebach, A. H. R.*—Flora of the British West Indian Islands, 1864.
- Halácsy, E. de*—Conspectus Florae Graecae, 3 vols., 1901-1904, Supplement, 1908.
- Hall, Robert*—History of Galashiels, 1898.
- Harvey, W. H. & Sonder, O.*—Flora Capensis, 3 vols., 1859-1865.
- Hayward, Ida M.*—Tweedside Alien Plants in *Tr. Bot. Soc. Edin.* xxiv. 38-44, 1909; Exhibited Plants, *l.c.*, p. iii.; Alien Plants introduced into the Tweedside District with Foreign Wool in *Proc. Linn. Soc.* 48, 1910; Exhibition, *l.c.*, 14, 1914.
- Hemsley, W. C.*—Biologia Centrali-Americana, 4 vols.
- Hooker, J. D.*—Flora of British India, 7 vols., 1872-1897; Flora Novae-Zelandiae, 2 vols., 1853-1855; Handbook of the New Zealand Flora, 1864-1867; Flora Tasmaniae, 2 vols., 1860.
- Index Kewensis*—J. D. Hooker & B. Daydon Jackson, 4 vols. and 4 Supplements, 1893-1913.
- Johnston, George*—A Flora of Berwick-on-Tweed, 2 vols., 1829-1831; The Natural History of the Eastern Borders, 1853.
- Kelly, Andrew & Shaw, W.*—Botany in A. Thomson's *Lauder and Lauderdale* 313-341, 1902.
- Kirk, T.*—The Student's Flora of New Zealand and the Outlying Islands, 1899.
- Marloth, R.*—The Flora of South Africa, vols. i. and iv., 1913, 1915.
- Moore, C.*—Handbook of the Flora of New South Wales, 1893.
- Muschler, R.*—A Manual Flora of Egypt, 2 vols., 1912.
- Nicholson, George*—Illustrated Dictionary of Gardening, 5 vols., 1882-1900.
- Pammel, L. H.*—The Weed Flora of Iowa, 1913.
- Post, G. E.*—Flora of Palestine, 1896.
- Reiche, C.*—Flore de Chile, 1896-1910.
- Rouy, G. & Foucaud, J.*—Flore de France, 14 vols., 1893-1913.
- Stuart, G. C. A.*—Account of some New and Rare Genera and Species of Plants found by the sides of the Tweed and Gala in 1868 in *Proc. Berw.* 73, 1869.
- Syme, J. T. Boswell*—English Botany, third edition, 13 vols., 1863-1896.
- Thellung, Dr Albert*—La Flore Adventice de Montpellier, 1912.
- Thistleton-Dyer, W.*—Flora Capensis.
- Thompson, John V.*—A Catalogue of Plants growing in the Vicinity of Berwick upon Tweed, 1807. 564 species, including Cryptogams, are enumerated.
- Trail, Prof. J. W. H.*—Topographical Botany of the River Basins Forth and Tweed in Scotland in *Tr. Bot. Soc. Edin.* xxii. 277, 1904.
- Uphof, J. C. Th.*—Die Pflanzengattungen, 1910.
- Wheldon, J. A.*—Some Alien Plants of the Mersey Province in the *Lancashire and Cheshire Naturalist*, 1914.
- Willkomm, M. & Lange, J.*—Prodromus Florae Hispanicae and Supplement, 4 vols., 1861-1893.
- Wood, J. Medley*—Flora of Natal, 1907.

DICOTYLEDONS.

1 RANUNCULACEAE Jussieu.

An important family of over 1000 species, divided into about 30 genera, widely differing from each other. Although world-spread, they are best represented in the temperate regions, a few extending to the tropics. The plants are herbs, rarely shrubs and woody climbers, distinguished by the numerous stamens, hypogynous flowers, apocarpous, usually numerous carpels; the fruit an aggregation of achenes or follicles, rarely baccate; the sepals often petaloid; petals sometimes absent; the juice watery, not milky. The name is derived from *ranunculus*, a little frog, given by Pliny in allusion to the watery habitat of many species. Among the plants of this group the *Clematis*, *Anemone*, *Adonis*, *Ranunculus*, *Aconitum*, *Delphinium*, *Paonia*, *Trollius*, *Helleborus* and *Aquilegia* afford many beautiful garden plants. Economically they have no great value, since acidity is a marked characteristic of the family. Indeed, some of the *Aconites* are the most deadly poisons known. Species of *Helleborus* have been in somewhat extensive use as a medicine, and *Delphinium Staphisagria* is a powerful verminicide.

6 RANUNCULUS (Tourn.) L.

A large genus of nearly 300 annuals or herbaceous perennials, world-spread, but most abundant in the temperate regions; having 3-5 green caducous sepals; petal-lamina with a nectariferous gland at base; flowers yellow, white or red; achenes compressed or subglobose, with one ascending seed. The *Batrachian* section, with white flowers, has some claims to generic distinction, and *Ficaria* is anomalous in its number of sepals.

- 27 **R. arvensis** L. *Corn Buttercup, Devil's Coach-wheel.*
Syme E. B. i. t. 38.

In corn crops and cultivated ground throughout Europe, except Norway, Finland and N. Russia. Moist meadow land at Samarcand (*Paulsen*), from Turkey to Beluchistan, Afghanistan, India, Egypt (forma) and N. Africa. Adventitious in New Zealand and N. America.

This well-known colonist in English corn-fields, the fruits of which are well supplied with strong, hooked spines, is occasionally found on

the river shingle in both Selkirk and Roxburgh, and doubtless owes its presence there to the fruits having become entangled in the wool.

Var. *RETICULATUS* (Schmitz & Regel Fl. Boenn. 339) Rouy & Fouc. Fl. Fr. i. 112. Var. *inermis* Koch Syn. i. 20, 1842.

This differs from the type in having the spines reduced to tubercles. It is a local form.

First record : Tweedside, Kelso, Roxb., A. Brotherston in *Rep. Bot. Rec. Club* 29, 1874, and *Proc. Berw.* 135, 1873. He records the type as a wool alien, *l.c.* 98, 1875.

29 *R. trilobus* Desf. Fl. Atlant. 113, t. 437, 1798.

R. philonotis Ehrh., var. *trilobus* Lois. Fl. Gal. ed. 2, i. 398, 1828.

R. sardous Crantz, var. *trilobus* Burnat Fl. Alpes Marit. i. 39, 1892.

Geographical area : Portugal, Spain, France, Italy, Greece, Turkey, Cyprus, Tunis, Algeria, Morocco, Azores, Canaries, Madeira. Growing usually in damp clayey soils and on the borders of cornfields, chiefly near the sea.

Annual, 2-3 dm. high, with small pale yellow flowers and fruits tuberculated on both sides.

First record : Tweedside, Kelso, Roxb., 1876, A. Brotherston in *Herb. Druce*, and in *Rep. Bot. Rec. Club* 98, 1875.

Thellung (*Fl. Adv. Mont.* 242) also records it from Central France as the result of wool-washing.

31 *R. muricatus* L.

Reichb. Ic. f. 4615.

Damp waysides, wet places, etc., of S. Europe—Portugal to Greece, Morocco to Syria, Egypt, Persia, Arabia, Bokhara, India, Madeira, Canaries. Adventitious in America, Australia and New Zealand.

Annual, 0.5-3 dm. high, usually diffuse, with small bright yellow flowers and large carpels much compressed and strongly tuberculate, the hooked beaks of which easily become entangled in wool. It may have come from Chilean wool.

First Tweedside record : I. M. H. Found in full flower in July 1913 on damp sandy soil on shingle at the junction of the Gala and Tweed, Selk. Of rare occurrence. Flowering July to August.

4 PAPAVERACEAE Jussieu.

A family of 30 genera and about 350 species ; natives chiefly of the north temperate zone, consisting mainly of annual or perennial, rarely shrubby species, often having milky juice ; characterised by their regular flowers, two caducous sepals, four petals, indefinite stamens, capsular fruit and numerous ovules on prominent parietal placentae.

Many of the species are brilliantly coloured and being gregarious give magnificent colour effects, as in the case of the Field Poppies, the Californian *Eschscholzia*, the Yellow-horned Poppy, or the varied tints of the Opium or Garden Poppy.

22 PAPAVER (Tourn.) L.

A large genus of about 50 bright-coloured red, purple, white or yellow annual or perennial species, some of which are now spread widely over the world's surface with cereal cultivation. Probably our Corn Poppies had their origin in South-West or Central Asia. In Britain the Poppies are mainly adventive. The genus is characterised by regular flowers, the capsule dehiscing at the top by pores under the eaves of the stigmatic disk, which consists of from 4-20 sessile stigmas. The juice is milky. That obtained from *Papaver somniferum*, largely cultivated in India, Persia and Turkey, forms the important drug, opium, from which morphia is obtained. The name *Papaver* was used by Pliny. The Poppy is engraved on Greek coins circa 500 B.C.

84 *P. hybridum* L.

Round Rough-headed Poppy.

Syme E. B. i. t. 62.

Occurs as a cornfield colonist of uncertain appearance in S. England, and as such is spread over Southern, Central and Eastern Europe, in some localities of which it may be native. It also occurs in the Caucasus, Mesopotamia, Persia, India, Syria, Egypt, Northern Africa, Canaries and New Zealand.

The bristly capsules become entangled in the wool, as in the case of *P. argemone* L. Plants have from time to time been found since 1908 near Galafoot, in Selk. and Roxb., by I. M. H., flowering July to September. The ovate globose bristly capsules and crimson petals of this annual species distinguish it from its allies. The Linnean name is erroneous as it is not a hybrid.

P. somniferum L., *P. Rhoeas* L. and *P. dubium* L. are also found by the Tweed, but their occurrence is probably due chiefly to operations of horticulture or agriculture.

23 ARGEMONE (Tourn.) L.

A small genus of about 7 annual or perennial herbs; natives of the west coast of N. and S. America, with handsome yellowish-white flowers and yellowish juice, differing from the poppies in their prickly leaves, often blotched with white. The name is derived from *argema*, eye-cataract, for the cure of which *Papaver Argemone* was once used.

87 *A. mexicana* L.

Prickly Poppy, Devil's Fig.

Waste places, cultivated ground, etc. Native of Central America and the West Indies; adventive in tropical and sub-tropical America, Africa, Canaries, Asia, Australia and rarely in Europe. In 1790 Loureiro recorded it from Cochin China.

A showy annual or biennial species, with prickly bristles, yellow juice, leaves blotched with white, prickly calyx, and yellow flowers, now rapidly spreading as a weed over the warmer regions of the world. Its occurrence by the Tweed may be due to the capsules becoming entangled in Argentine or Australian wool.

First Tweedside record: I. M. H. Found on shingle of the Gala, Selk., in flower, July to August 1916.

Var. *OCHROLEUCA* (Sweet) Lindley, Bot. Reg. xvi. t. 1343, 1830. *A. ochroleuca* Sweet Brit. Flower Gard. iii. t. 242, 1828.

Differs from the type in its whitish flowers.

Found at Galafoot, Selk., I. M. H. in 1913.

26 ROEMERIA Medik. in Usteri Ann. Bot. iii. 15, 1792.

A small genus of 2 or 3 pretty annuals, natives of the Mediterranean region, stretching to the Himalayas and S. Africa, differing from *Papaver* in its linear fruit with a single locus. The flowers are violet or reddish and the seeds uncrested. The name commemorates Roemer, once a Professor of Botany at Landshut.

91 **R. hybrida** DC. Syst. ii. 92, 1821. *Violet Horned Poppy.*
R. violacea Medik., l.c. *Chelidonium hybridum* L. Sp. Pl. 506, 1753. Syme E. B. i. t. 64.

Formerly occurred as a corn colonist in Cambridgeshire, etc. Now found rarely as a ballast alien in the docks of Boston, Bristol, Leith, etc.

A beautiful species owing to its deep violet petals, which occurs in the Mediterranean area—Spain, S. France, Italy, Greece, Turkey, and in Taurus, Caucasus, Syria, Palestine, Persia, Beluchistan, Afghanistan, Egypt, Tunis, Algeria, Morocco. The seeds may also be introduced with chicken corn. The long capsules and violet petals readily distinguish it from its allies.

First Tweedside record: I. M. H. Found on the banks of the Tweed at Galashiels, Selk., in flower, June 1909.

Linnaeus is again responsible for a misnomer as the plant is not a hybrid.

6 CRUCIFERAE Jussieu.

An extremely natural and large family containing over 200 genera and over 2000 species; world-spread, but most richly represented in the temperate regions of Europe, N. Asia, as well as in Asia Minor, occurring also on the mountain ranges of the tropics. Some of the species, such as the Turnip and Cabbage, have been cultivated for food from remote antiquity. These and others possess antiscorbutic properties, while from the seeds of mustard and other species oil and condiments are obtained. The plants are annual, biennial, or perennial, rarely shrubby at the base, and have usually yellow or

white or rarely purple, lilac, or even reddish ebracteate flowers. Their normally tetradynamous stamens, and the petals arranged in a cross-like manner (hence the family name) give ready means of identification.

35 RADICULA (Dillenius, 1719) Hill Brit. Herb. 264, 1756.

Roripa Scop. Fl. Carn. 520, 1760. *Nasturtium* (L.) R. Br. in Ait. Hort. Kew. iv. 109, 1812.

A genus of which about 70 species have been described, world-spread, having elongate fruits, turgid, not compressed at right angles to the septum, dehiscing through their entire length; stigma small, simple, terminal: seeds minute, 2-seriate: radicle accumbent; flowers usually yellow.

126 (2) *R. nana* (Wedd.) comb. nov.

Roripa nana (Wedd.) Thellung in Sched. *Nasturtium nanum* Wedd. in Ann. Sc. Nat. sér. iv, v. i. 290, 1864.

Geographical area: S. America—Bolivia, Andes and Peru.

Described by Weddell, "*a. segmentis foliorum ovatis oblongisve integris aut extus ad basin lobulis acutis, et b. segmentis foliorum gracilibus sub-pinnatilobatis, segmentis aliis minimis cum majoribus alternantibus.*"

First found in Europe in Selk. by I.M.H. in August and September 1910. See *Rep. B.E.C.* 15, (1917) 1918. Found near the banks of the Ettrick, Selk., in the vicinity of woollen mills. Det. A. Thellung.

46 SISYMBRIUM (Tourn.) L.

An awkward, complex and very puzzling genus of about 100 herbaceous plants, which in many cases resemble species of *Brassica* and *Erysimum*. They are chiefly European, W. Asian and Himalayan, but a few are peculiar to S. Africa, and others to N. and S. America. The linear fruit, sessile stigma, incumbent or accumbent cotyledons and divided leaves which, if hairy, are not canescent, are distinguishing characters; but in reality the genus is an unnatural one and might with advantage be divided into three or more. The name is derived from the Greek word used by Dioscorides to designate a species of mint.

183 *S. Sophia* L.

Fluxweed.

Descurania Sophia Webb. Syme E. B. i. t. 98. Reichb. Ic. f. 4405.

In waste places throughout Europe, perhaps native in the eastern counties of Britain, but usually sporadic. In Asia Minor, Syria, Persia, Siberia, Afghanistan, Beluchistan, Punjab, Kashmir, W. Tibet at 4200 m., China, N. Africa and Egypt. Adventive in N. America from New Brunswick to Ontario, south to New York and Illinois, Chile and New Zealand.

A small-flowered annual or biennial species with very finely divided leaves and one-nerved fruits.

First record: Kelso, Roxb., A. Brotherston in *Rep. Bot. Rec. Club* 99, 1875 (but not of wool origin). Gala side, Selk., I.M.H., 1909. Flowering July to September. Of robust growth but not of very frequent occurrence.

184 *S. altissimum* L.

Tumbling Mustard.

S. pannonicum Jacq. *S. Sinapistrum* Crantz. Reichb. Ic. f. 4406. Weed Fl. of Iowa 166, f. 93.

Central Europe from Denmark to Transylvania, Turkey, Russia, Armenia, Persia, W. Asia, Asia Minor, India, W. Tibet. Rapidly spreading and adventive in N. America since 1878, and a bad weed in the North West from Quebec and Ontario to Alberta, Vancouver and Missouri.

Annual or biennial, 3-6 dm., with very pale yellow flowers; fruits three-nerved; lower leaves runcinate-pinnatifid, the upper sessile with narrow linear lobes; sepals spreading. The rosette of root-leaves soon disappears.

First record: Found from August 1913 onward on the banks of the Gala and Tweed, one to three miles below Galashiels; also on waste-heap at Selkirk, Selk. and Roxb., I. M. H. Flowering August to September.

185 *S. orientale* L.

S. Columnae Jacq. Fl. Austr. iv. 12. Reichb. Ic. f. 4407.

Waysides, field borders, dry hilly places in France, Spain, Italy, Austria, Hungary, Serbia, Montenegro, Greece, Transylvania, Russia, Taurus, Caucasus, Caspian area, Turkestan, Asia Minor, Syria—near Damascus, etc., Afghanistan, India—W. Himalaya, Kashmir, Tibet, Algeria, Morocco, Canaries. Often a weed of cultivation. Found about docks and introduced as a corn alien.

A biennial species, 2-6 dm. high. Its smaller and pure yellow flowers, and the erect sepals, distinguish it from the commoner *S. altissimum*. The upper leaves are also much less cut. In *altissimum* they are usually cut into very narrow segments, and the flowers in that species are creamy white.

First record: I. M. H. in *Tr. Bot. Soc. Edin.* 40, 1909. Very plentiful on the banks of the Gala from Galashiels, Selk., onwards; also found on both sides of the Tweed from Galashiels to Kelso, Roxb., 1908-16. Flowering in August and September. Fruiting freely. Det. G. C. Druce.

188 *S. Irio* L.

London Rocket.

Syme E. B. i. t. 99.

All Europe except the extreme north, often sporadic, Caucasus, Armenia, Persia, Turkestan, Beluchistan, abundant in Afghanistan and in India—Rajputana to Punjab, N. Africa, Egypt, Canaries, Madeira.

A glabrous, light green annual or biennial, 3-5 dm. high, with deeply pinnatifid or pinnate leaves; flowers small, bright yellow; sepals ovate; fruit three-nerved, long linear, overtopping the upper flowers. This is the species which came up in such great profusion on the ruins round St Paul's in 1667 after the great fire in London, which is described in Morison's *Praeludia*.

Found by I. M. H., August 1909, on damp soil on shingle by the side of the Tweed two miles below Galashiels, Roxb. Flowering July to September. It has long been naturalised at Berwick-on-Tweed, whence it was recorded by Ray in *Cat. Plant. Ang.* 100, 1677.

193 (2) *S. Turczaninowii* Sonder in Harvey & Sonder Fl. Capensis i. 26, 1859.

Tricholobos capensis Turcz. Anim. n. 1101. (There is already a *Sisymbrium capense*). Fig. 1.

South Africa, where it has been found by the Caledon River.

A pretty species, 3-4 dm., densely hairy with simple hairs; stem erect, slightly branched; leaves pinnatipartite, with 7-9 ovate obtuse and toothed lobes on each side; silicle terete, densely covered with short bristles, valve three-nerved; claw of petal as long as calyx; lamina of petal oval; seeds minute. The fruit gets entangled in the fleece owing to its bristly covering.

First record in Europe: I. M. H. in *Rep. B.E.C.* 189, (1915) 1916. It occurred as a large branching plant on the banks of the Tweed near Galashiels, Selk., in flower and fruit in August 1914. Det. A. Thellung.

193 (3) *S. brachycarpon* Richardson in Frankl. Journ. 744, 1823. *S. multifidum* (Pursh) MacMillan, sub-sp. *brachycarpum* (Richardson) Thell. in Ill. Fl. Mitt. Eur. iv. 153, 1916. *Sophia incisa* Greene Pittonia iii. 93, 1896. *Descurainia incisa* Britton Mem. Torrey Club v. 173, 1894. *S. pinnatum* Rep. B.E.C. iii. 152, (1911) 1912, not of Greene.

America—dry soil, Minnesota to North-West Territory and British Columbia, south to Tennessee, Kansas, Texas and California.

Closely allied to *Erysimum pinnatum* Walter, *Sisymbrium canescens* Nuttall and *S. multifidum* MacMillan, of which Thellung makes it a sub-species. Leaves pinnatifidly divided, the divisions 1-2 pinnatifid into linear, oblong, entire or toothed segments; pod linear-oblong; pedicels widely ascending, mostly longer than pods, glabrate or somewhat canescent, when glandular hairs are also present.

First found in Scotland by I. M. H., July 1916, on the banks of the Gala a short distance below Galashiels, Selk. Det. A. Thellung.

First found in Britain at Par, Cornwall, by G. C. Druce in 1911, as the forma *eglandulosa* Thell. in Hegi Ill. Mitt. Eur. iv. 153, 1916. See *Rep. B.E.C.* 15, (1917) 1918.



Fig. 1.

SISYMBRIUM TURCZANINOWII Sonder.

193 (4) S. sp. cf. myriophyllum (Willd., H. B. K.) ex DC. Syst. ii. 477.

Geographical area : Ecuador—at the base of Cotopaxi.

Plant 6-10 dm., branched ; leaves bipinnatisect, segments obtuse ; petals yellow, longer than sepals ; silicle lanceolate.

Found in the vicinity of the Ettrick, near woollen mills, Selk., by I. M. H. Robust, branching plants observed July to November 1913, also in November 1916.

47 ERYSIMUM (Tourn.) L.

A genus of about 150 [80 D.T.] annual, biennial or perennial species, widely distributed in the northern hemisphere, differentiated from *Sisymbrium* by the foliage being hoary with branched hairs and the more prominent midrib on the fruit valve. A few species are handsome garden plants, but they have no economic value despite the origin of the name *Erysimum* from *eryon*—to draw, from the supposed blistering effects of some species.

197 E. cheiranthoides L. *Treacle Mustard, Wormseed Mustard.*
Syme E. B. i. t. 102.

In cultivated ground and waste places throughout Europe (except Greece and Turkey), Siberia, Turkestan, China, Egypt. Adventive in N. America.

An erect annual, 1·5-10 dm.; radical leaves at first rosulate, but soon withering ; stem leaves lanceolate-elliptical, narrowed at base, not amplexicaul, waved or remotely dentate, dull green, with scattered trifid or stellate hairs ; flowers yellow, about 4 mm. diameter, the claw about as long as sepals ; fruit slightly spreading, 2-2·5 cm., slightly curved, slender, four-angled, valve one-nerved ; pedicels nearly half as long as fruit.

First record : River side, etc., Kelso, Roxb., A. Brotherston in *Rep. Bot. Rec. Club* 99, 1875. Found by I. M. H. in 1909 and subsequently near the mouth of the Gala and along the banks of the Tweed about a mile below Galashiels, Selk. Frequently of strong growth. Flowering August to September.

198 E. repandum Höjer in L. Amoen. Acad. iii. 415, 1756.

E. rigidum DC. Reichb. Ic. ii. f. 4384. Jacq. Fl. Austr. i. 16, t. 22.

In cultivated ground and in waste places in Germany, Austria, Hungary, Serbia, Albania, Greece, Turkey, Transylvania, Poland, Russia, Syria, Palestine, Persia, Beluchistan, N.-W. India—ascending in Kashmir to 2200 m. Usually adventive as in Britain, France, and many other countries in Europe, the Atlantic ports of the United States, Algeria, and Egypt, but probably native in N. India. In the Harboi Hills of Beluchistan it is called Hatamboi, meaning spring scent, and is used there as sheep fodder.

Usually a branched annual of 15-30 cm., with oblong-linear, repand-dentate leaves, narrowed at base, often recurved at apex, with a short, dense, hardly noticeable pubescence of bipartite (and a few tripartite) hairs; flowers small, 7-9 mm., yellow; silicles 4-8 cm., borne on short thick pedicels, at first erect, on ripening spread widely, rigid, often incurved and subtetragonous; seeds oblong, reddish brown.

First record for Tweedside, I. M. H. Found growing abundantly at the junction of the Gala and the Tweed, Selk. In flower and fruit during July 1910. Like *Sisymbrium orientale* this plant is remarkable for the length of its pods and the large numbers of its seeds.

48 CONRINGIA (Heist.) Adans. Fam. Pl. ii. 418, 1763,
as *Couringia*.

A small genus of about half-a-dozen annual or biennial species, found in Europe and N. Asia, with glabrous and glaucous, usually entire, stem-clasping leaves; named after Hermann Conring, a juriscult.

200 C. orientalis Dumort. Fl. Belg. 123, 1827.

Brassica orientalis L. *Erysimum orientale* Mill. *E. perfoliatum* Crantz. Syme E. B. i. t. 101. Reichb. Ic. ii. 8, f. 4382. Weed Fl. of Iowa 161.

In ground disturbed by man, in waste places in Belgium, France, Germany, Spain, Italy, Austria, Hungary, Serbia, Poland, Thrace, Russia, Anatolia, Syria, Persia, Armenia, Egypt—recently adventive, and in N. America.

A rather succulent annual, 6-7 dm., striking looking because of its pale green, glaucous, entire, sessile, obtuse, amplexicaul leaves, its long, narrow, creamy white petals and long, slender, linear, 4 angled silicles. It varies much in size, being sometimes quite a large cabbage-like species. Indeed, Caspar Bauhin called it *Brassica campestris perfoliata flore albo*. First recorded in 1650. Ray saw it at Harwich in Essex, and Samuel Dale found it on the cliffs near Orford in Suffolk about 1710. This plant may owe its presence on the Tweed to some other source than wool, but it inhabits districts from which wool comes to Britain.

First record: *Erysimum orientale*, Tweedside, Stuart in *Proc. Berw.* 186, 1868. Kelso, Roxb., to Gala, Selk., A. Brotherston, *l. c.* 137, 1873, in *Rep. Bot. Rec. Club* 186, 1876. Found sparsely by I. M. H. near the junction of the Gala and the Tweed, Selk., in flower and fruit in August. An erect plant of about 24 inches, with long seed pods.

49 CAMELINA Crantz Stirp. Austr. i. 18, 1759.

A small genus of about 10 annual or biennial herbs, with glabrous or hispid leaves, yellow flowers, broad one-nerved fruit with inflated

valves ; spread over the Mediterranean region and extending into Central Asia. The name is derived from *chamai*, the ground, and *linon*, flax, but the assigned reason seems rather doubtful, unless the stiff upright stems suggest a resemblance to flax.

202 C. sativa Crantz, *l.c.*

Gold of Pleasure.

Myagrum sativum L. Syme E. B. i. t. 141.

Throughout Europe, usually in cultivated ground, often among crops, especially those of clover and flax. In Taurus and the Caucasus. Adventive in Tunis, New Zealand and N. America. Its native origin is uncertain.

A rather attractive species from its bright yellow flowers, elegant habit and prominent leaf auricles. The fruits are unlike any other British species. The plant is cultivated on account of the fixed oil which is contained in the seeds, but except for soap-making it is of little value. The seeds are, however, readily eaten by birds.

First record : Galashiels, Selk., 1868, Stuart in *Proc. Berw.* 1869. Found growing freely on the banks of the Gala below Galashiels, Selk., I. M. H. Flowers and fruit in July 1911-1916.

51 BRASSICA (Tourn.) L.

A large and very puzzling genus of about 70 species, chiefly found in the temperate regions of the eastern hemisphere. Two or three have their home in South Africa. It includes several often excessively variable plants, such as cabbage, turnips, rape and mustards, of very ancient culture. They are mainly characterised by the conuplicate cotyledons and linear or oblong fruits. They are usually biennial, more rarely annual or perennial plants, with yellow or white flowers. It has been suggested that the name is derived from the Celtic word *bresic*—a cabbage.

215 B. nigra Koch in Roehl. Deutsch. Fl. ed. 3, { *Black Mustard.*
iv. 713, 1833.

Sinapis nigra L. *Brassica sinapioides* Roth. Syme E. B. i. t. 85.

Throughout Europe except Scandinavia, N. Russia and Finland ; in Asia Minor, Afghanistan, Assyria, Egypt, N. Africa ; probably native of central Asia. Largely cultivated throughout the world, especially in California, India and Tibet. Adventive in N. America and New Zealand.

A tall perennial, 7-20 dm., sparingly hairy, with lyrate leaves, cylindrical fruits appressed to the axis, and dark brown seeds, forming the mustard of commerce, from which also a valuable fixed oil is obtained by pressure.

First record : *Sinapis nigra*, plentiful from Eden to Gala, Roxb. and Selk., A. Brotherston in *Proc. Berw.* 137, 1873.

Plants of *B. Napus* L., *B. Rapa* L. and *B. oleracea* L. occur on the banks of the Gala and the Tweed, Selk. and Roxb., but not necessarily as wool introductions, though some may be thus brought.

- 217 *B. alba*** Boissier Voy. Esp. ii. 39, 1839. *White Mustard.*
Sinapis alba L. Syme E. B. i. t. 84.

All Europe except N. Sweden, Finland, N. Russia, but often a weed of cultivation. In Asia Minor, Armenia, Mesopotamia, Syria, India, Egypt, Canaries, Madeira (? adv.), and sub-spontaneous over wide areas.

Annual, stem 2-5 dm., branched, with bristly hairs; leaves stalked, deeply cut, lyrate-pinnatifid; fruiting pedicels very spreading; fruit oblong, 5 cm., hispid with persistent, ribbed, often curved beak; seeds subglobose, pale yellow.

First record: See *Tr. Bot. Soc. Edin.* 40, 1909. Of frequent occurrence by the Tweed in both counties near Galashiels and at Selkirk, but its presence may be due in great part to agriculture. There is, however, little doubt that seeds are also brought in the wool from varied sources.

- 218 *B. juncea*** Cosson App. Fl. Juven. in Bull. } *Indian Mustard.*
 Bot. Soc. Fr. vi. 609, 1859. }
B. lanceolata Lange. Britton & Brown Ill. Fl. North. U.S., &c., ii. 118. *Sinapis juncea* L.

A native of the east, and extensively cultivated. Sub-spontaneous in Denmark, Russia, Egypt, Arabia, N. and E. Africa, Asia—central, south and east to China, in the southern United States and in the tropical and sub-tropical areas of both hemispheres.

A yellow flowered species, 6-9 dm., allied to the British Black Mustard, but differing in its less hairy foliage and fasciculate, not spreading branches, and essentially in the much larger silicles (2-5 cm.), which are also less appressed to the flowering axis than in *B. nigra*. The seeds on pressure yield a bland fixed oil of considerable economic value and the plant is often used in the east for a salad.

First record: I. M. H. and G. C. D. in 1910 on the river shingle at Galafoot, Selk.

- 224 *B. adpressa*** Boissier Voy. Esp. ii. 38, 1839.
Sinapis incana L. *Erucastrum incanum* Koch. *Brassica incana* Schultz, 1846, not of Tenore, who previously gave the name to a S. Italian species. *Hirschfeldia incana* Lowe. Syme E. B. i. t. 86. E. B. Suppl. t. 2843.

On waysides, in stony and sandy places and dry hilly districts, but often adventive, in Portugal, Spain, France, Germany, Switzerland, Italy, Dalmatia, Albania, Greece, Turkey, Taurus, Palestine, Caucasus, N. Africa, Canaries. Adventive in New Zealand.

Very similar to *Brassica nigra* but a much grayer plant from the short bristly hairs and shorter silicles. Many botanists put it in a distinct genus—*Hirschfeldia*, the seeds being sometimes round, as in true *Brassica*, and sometimes flattened as in *Erucastrum*.

First record: I. M. H., 1914. Large branching plants, occasionally 3 feet high, grew on the banks of the Gala from the centre of Galashiels to its junction with the Tweed, Selk. Flowering July to September. Det. A. Thellung.

52 DIPLLOTAXIS DC. Syst. ii. 628, 1821.

A genus of about 30 species, chiefly from the Mediterranean region, Egypt and western Asia, two being found in Chile. Closely resembling *Brassica*, from which it mainly differs in having the wingless seeds arranged more or less in two rows. The flowers are yellow or white, veined with lilac.

227 *D. muralis* DC., *l.c.*

Sand Rocket.

Syme E. B. i. t. 94.

From Britain and Holland to Transylvania, but often adventive. N. Africa. A doubtful native of the British Isles.

Annual or biennial, with stem leafy or leafless; leaves pinnatifid; lobes near together, rather triangular; flowers yellow, about 15 mm. diameter; fruit spreading, narrowed at top only; beak subconical; plant with a foetid, cressy smell.

Recorded from cultivated ground, Kelso, Roxb., A. Brotherston in *Rep. Bot. Rec. Club* 209, 1877. Found on Tweedside, Selk., I. M. H., 1916.

57 CORONOPUS (Ruppius) Miller Gard. Dict. Abr. 1754.

A small genus of about a dozen very widely dispersed, weedy, prostrate herbs with entire or more or less deeply-cut leaves, inconspicuous flowers and indehiscent fruits broader than long, two-jointed, each one-seeded.

233 *C. didymus* Sm. Fl. Brit. ii. 691, 1800 { *Lesser Wart Cress.* (*didyma*).

Senebiera didyma Pers. *S. pinnatifida* DC. *Lepidium didymum* L. Syme E. B. i. t. 159.

Throughout tropical America; probably adventive in Britain, Ireland, Scandinavia, Belgium, Holland, Germany, France, Portugal, Spain, N. Italy, Sicily, Canaries, Madeira; certainly adventive in N. America, Cape Colony, Natal, New Zealand and Australasia.

A small prostrate annual with strong cress-like smell and pinnately and finely divided leaves, now spreading from the coast inland. The fruiting racemes are lengthened, the silicles not tuberculate, and the stigma not apiculate.

First record: Found abundantly by I. M. H. since 1908 on the banks of the Gala and the Tweed below Galashiels, but especially abundant in the yard of Galashiels Skin-works, Selk., also in Roxb. Flowering July to September.

- 234 **C. squamatus** (Forsk.) Aschers. } Wart or Swine's Cress.
Fl. Prov. Brandb. 62, 1864. }

C. procumbens Gilib. Fl. Lit. ii. 52, 1781. *C. Ruellii* All. *C. verrucarius* Thell. *Senebiera Coronopus* Poir. *Lepidium squamatum* Forsk. Fl. Aegypt-Arab. 117, 1775. Syme E. B. i. t. 160.

All Europe except the extreme north, and throughout the greater part of the Old World. Adventive in New Brunswick, U.S.A., New Zealand and Australasia. Probably native in many parts of England, but thinning out northwards; becoming rare and doubtfully native in Scotland. In England it is more frequent in places trodden by cattle and on mud-topped village walls, but it is hardly to be found in quite wild places. If introduced, it must have been at a remote period.

The plant is readily known by its glabrous foliage and cressy flavour, by its small white petals in a very dense, short raceme, and by the indehiscent silicle valves being covered with rugose waved ridges. It is doubtless these roughnesses which adhere to the wool, for the frequent presence of this Crucifer on the shingle by the Tweed is almost certainly due to wool-washing.

First record for Selkirkshire: I. M. H., 1909. Found on shingle at the junction of the Gala and the Tweed, but less abundantly than *C. didymus*. Flowering July to September. Recorded from waste ground at Haddon, Roxb., by Johnston, *N. H.* 371, 1853.

58 LEPIDIUM L.

A large genus of 120-150 [100 D.T.] annual, perennial or suffruticose species, erect or spreading; leaves entire or divided; flowers small, white, ebracteate; petals sometimes absent; stamens often reduced to four or two; fruits oblong-ovate, obcordate, orbicular, much flattened laterally, notched or entire at summit, winged or not; seeds, one in each loculus. The name used by Dioscorides (ii. 105) is derived from *lepis*, from the scale-like form of the fruit.

- 237 **L. Draba** L. Hoary Cress.
Cardaria Draba Desv. Syme E. B. i. t. 158.

As a wayside weed throughout Europe except N. Russia and Scandinavia. In the Caspian area, Turkestan, Afghanistan, Beluchistan, the Punjab, Morocco, Algeria, Tunis, Egypt. Adventive at Astoria, New York and in California, as in many of its European localities. New Zealand, an increasingly aggressive species. It is said by Dunn to be native in dry sterile ground in S.-E. Europe and S.-W. Asia, being especially abundant in the Caspian region.

A very distinct, perennial species, which might well form the type of a distinct genus, characterised by the cordate-deltoid fruit, which is sub-didymous from the constriction between the valves. The plant is, moreover, distinguished by the leaves being broadly obovate, dentate or sinuate, somewhat glaucous, subglabrous or hoary with adpressed hairs; the upper or stem leaves strongly amplexicaul and auriculate; the inflorescence a short raceme of numerous white flowers.

First record: Tweedside, about 70 yards below Kelso Bridge, Roxb., seeming to have been established a long time, A. Brotherston in *Rep. Bot. Rec. Club*, 75, (1874) 1876. Found by I. M. H. in 1908 on wool-waste heaps in mill yards at Galashiels, also at the junction of Gala and Tweed, Selk., and near the Tweed at Melrose, Roxb. Flowering June to September.

240 *L. ruderale* L.

Bowyer's Mustard.

Syme E. B. i. t. 154. Reichb. Ic. ii. f. 4215.

A plant of waysides and waste ground throughout Europe except N. Norway, Lapland, N. Russia, Finland, Greece, the Italian Isles, Spain and Portugal. It occurs in Siberia, Mesopotamia, Armenia, Caucasus, Assyria, Abyssinia, Angola. Adventitious in Texas, Washington and the Cape.

The plant has a strong cress smell; is a wiry, much-branching annual with small leaves; the petals small or absent; the inflorescence corymbose, rather elongated; the seeds small, yellowish-brown, very abundant, contained in oval-orbicular lenticular siliques.

First record: Two different places in bed of Gala, Selk., 1868, Stuart in *Proc. Berw.* 76, 1869-72.

247 (2) *L. africanum* DC. Syst. ii. 552, 1821, var. *capense* Thellung in Viertelj. Zürich. Nat. Ges. ii. 187, 1906.

See also Thellung Mon. Lepid. 181, 1906. *L. capense* Thunb. Prod. Fl. Cap. ii. 107, 1800. Harvey & Sonder Fl. Cap. i. 29, 1859-60, not of DC. *L. flexuosum* Ecklon & Zeyher Enum. Pl. Afr.-Austr. 6, 1835.

A native of hills and waste places, common near Cape Town and ascending on the cliffs of the Lion's Head to 100 metres. At L'Agulhas, Port Elizabeth, Zondag River, Albany, etc.

A perennial with ascending or suberect stems, 20-40 cm. high, round and slightly hairy or naked, slightly striate, leafy and branched, often pubescent with slender curving hairs; the basal leaves often pinnate or lyrate-pinnate, the segments semi-ovate; the petiole dilated at base and thickly covered with short hairs; the stem leaves small, oblanceolate; sepals $\frac{1}{2}$ - $\frac{3}{4}$ mm. long, ovate, with white margin; petals oblong; stamens 2-4; nectaries

4-6 ; raceme elongated, lax ; silicle $2\frac{1}{2}$ -3 by $1\frac{3}{4}$ -2 mm., elliptic or narrow ovate-elliptic, compressed, apex rather acute ; seeds $\frac{1}{4}$ mm. long by $\frac{3}{4}$ mm. broad, ovoid, compressed, brown, slightly papillose-granulate, without margin ; embryo notorrhizus.

First found in Britain in 1913 by I. M. H., at Galafoot, Selk. See *Rep. B.E.C.* iii. 309, (1913) 1914. On alluvial soil under Red Bridge, over Tweed, about two miles from Galashiels. Flowering in September. A solitary specimen also grew on a recently made embankment near Red Bridge—a striking, feathery-branching plant, 40 cm. in length, of much more robust growth than the other. Seeding in September.

- 247 (3) **L. Eckloni** Schrad. Ind. Sem. Hort. Gott. 3, 1830, var. **hirtellum** Thellung in Viertelj. Zürich. Nat. Ges. ii. 170, 1906.

Mon. Lepid. 146, 1906, under sub-sp. *Eckloni*. *L. hirtellum* Sonder in Harvey & Sonder Fl. Cap. i. 30, 1859-60. *L. pinnatum* Ecklon & Zeyher Enum. 7, 1834-7, not of Thunberg.

Geographical area : Bloemfontein, Pietersburg, Transvaal ; Orange Colony ; Cape and Capeland—Grahamstown, as the type. Bear pools, "Valleyen," in Quaggasflats, Uitenhage, *Herb. Sonder*, as var. *hirtellum*. Cape Agulhas, Ecklon in *Herb. Petrograd*.

A small, slightly branched, suffruticose plant ; stem erect, decumbent at base, rough with very short hairs, as are the leaves, the lower being oblong, serrate, uncial, about 4 mm. wide, narrowed into the petiole, the rest pinnatifid, uncial ; the rachis scarcely a millimetre wide with 3-4 lobes on each side, 4 mm. long ; racemes about 5 cm. long ; the rachis and peduncles at first hairy, at length glabrescent ; silicle elliptic, slightly emarginate, with a very short style equalling the notch, glabrous.

First record : Galashiels. Selk., I. M. H. in *Rep. B.E.C.* 153, (1912) 1913. Found at the junction of the Gala and Tweed. Infrequent occurrence. Flowering September.

Christian Friedrich Ecklon wrote in conjunction with Karl Zeyher an Enumeration of South African plants in 1837.

- 247 (4) **L. linoides** Thunb. Prod. Fl. Cap. 107, 1800.

L. divaricatum Aiton, sub-species *linoides* Thellung Mon. Lepid. 143, 1906. Fig. 2.

In shrubby places in the Tulbagh Valley ; in the Roggeveld, Winterveld at 900-1200 metres, Abyssinia.

Plant glabrous ; stem 3-6 dm. ; basal leaves narrowed into petiole, cauline lanceolate-linear, 4-5 cm. long, 2-3 mm. wide, acuminate ; fruit racemes much elongated ; pedicel spreading, 2-3 mm. long ; flower minute ; silicle elliptic, obtuse, emarginate, 2 mm. long ; style very short, not projecting beyond the tips of the seed-cases.



Fig. 2.

LEPIDIUM LINOIDES Thunb.

First record: I. M. H., 1909. See *Rep. B.E.C.* 152, (1912) 1913. Found on damp sandy soil near Red Bridge, on Tweed, two miles below Galashiels, Roxb. Flowers in latter part of August and during September.

247 (4) *L. linoides* Thunb., var. *iberioides* (Desv. Journ. de Bot. 165, 1814, as a species), comb. nov.

L. divaricatum, sub-sp. *linoides*, var. *iberioides* Thell. *L. Iberis* Sieb. Fl. Maurit. Fig. 3.

Mauritius (Commerson in *Herb. Desv.*), Madagascar (*Herb. Montp.*), St Helena (Maxim. in *Hb. Petrograd*), Ascension (*Herb. Berl.*).

Stem erect, round, smooth, with filiform branches; leaves few, alternate, linear, acute, entire, the lower toothed at apex; raceme (fruiting) elongate, many-flowered; pedicels filiform, sub-erect; silicles $1\frac{3}{4}$ - $2\frac{1}{2}$ mm. long, elliptic, subemarginate, the valves carinate, winged; seed solitary in each loculus, small, reddish. In the type the silicles are larger— $2\frac{1}{2}$ -3 mm.

First record: Galashiels, Selk., I. M. H. in *Rep. B.E.C.* 187, (1915) 1916. Found on a stretch of shingle by Tweed about a quarter of a mile below its junction with the Gala. Flowering September.

247 (5) *L. Schinzii* Thellung in Viertelj. Zürich Nat. Ges. li. 182, 1906.

L. lacinum Syme in *Herb. Druce*, not of Meyer. *L. rudérale* in *Herb. Brit. Mus.*

A native of South Africa—Johannesburg, Modderfontein, Basutoland (*Herb. Montpellier*).

Perenne? Radix satis crassa, ramosa, descendens. Caulis plerumque unicus, suberectus, subcylindricus (leviter striatus), pilis gracilibus acutiusculis e basi patente arcuato-retrorsis, curvatis quasi granulatus, ramosus, ramis suberectis racemos terminales et axillares gerentibus. Folia inferiora mihi ignota; caulina firma, majora pinnatifida vel saltem pinnatim incisa lobis oblanceolatis obtusis, margine pilis brevissimis triangulari-acutis, basin folii versus leviter retrorsum curvatis obsita; caulina minora fasciculata, oblanceolata obtusiuscula, apice subdentata vel integerrima. Flores: sepala anguste ovata, albomarginata, caduca, petala nulla; stamina 2(-4) mediana; glandulae 4(-6) filiformi-elongatae, apice saepe leviter incrassatae, calycis $\frac{1}{3}$ - $\frac{1}{2}$ aequantes. Racemi fructiferi axillares breves, subcorymbosi, terminales elongati, graciles sed densissimi, siliculis quasi imbricatis approximatis, axi sulcato retrorsum pubescente, pedicellis subadpressis siliculae aequilongis. Silicula minima, ovata-elliptica, basi obtusa, apice obtusiuscula, compressa, apice levissime emarginata, stylo brevissimo emarginaturam replente, stigmate disciformi exserto; valvulae carinatae, apice parum alatae; septum anguste rhombico-ellipticum (1:4); stylo apiculatum. Semina anguste ovoidea (1:2), compressa, sublaevia, immarginata, luteo-fusca; embryo notorrhizus.

Plant about 30 cm. high, the lower stem leaves about 1 cm. long ; the calyx $\frac{1}{2}$ - $\frac{3}{4}$ mm. long ; fruit silicles about $1\frac{3}{4}$ mm. long by $1\frac{1}{4}$ mm. broad ; seeds about 1 mm. long by $\frac{1}{2}$ mm. broad ; raceme slender, cylindric, about 5 cm. long and 3 mm. thick.

The plant is allied to *L. trifurcum* Sonder, which is a nearly or quite glabrous plant.



Fig. 3.

LEPIDIUM LINOIDES Thunb., var. *IBERIOIDES*.

First record: Side of Gala, Selk., July 1873 (named *L. lacerum* by Syme). Coll. A. Brotherston in *Herb. Druce*. Found since 1908 in successive years on the banks of the Tweed between Galashiels and Melrose, Roxb., I. M. H. See *Rep. B.E.C.* 8, (1914) 1915.

247 (6) *L. trifurcum* Sonder in *Linnaea* xxiii. 4, 1850.

South Africa—Niewveld, Karrao, &c., on the Modder River, Bechuanaland.

Suffruticose, glabrous, 3-4 dm.; stem round, with alternate, erect, slender, pale green branches; leaves linear-subulate, canaliculate, trifurcate, the lobes erect, patulate, acute; flowers small, white; fruit oblong-ovate, emarginate; style short.

First found in Europe by I. M. H. on the banks of the Tweed below Galashiels, Selk., in September 1912. See *Rep. B.E.C.* 16, (1916) 1917. Det. A. Thellung.

247 (14) *L. Aucheri* Boissier in *Ann. Sc. Nat. Bot. sér. 2*, xvii. 195, 1842.

See also *Fl. Orient.* 354, 1867. Thellung *Mon. Lepid.* 119, 1906. Muschler *Man. Fl. Egypt* 425, 1912. *Rep. B.E.C.* iii. 309, (1913) 1914. Aschers. & Schweinf. *Ill. Fl. Egypte* 40. Fig. 4.

Geographical area: Egypt, Syria, Arabia, Mesopotamia, Persia, Turcomania, Afghanistan, Beluchistan.

An annual species, 1-3 dm., branched, prostrate or ascending, stellate-puberulent; the lower leaves pinnatipartite with short obtuse lobes, the upper oblong, dentate or crenate; fruiting raceme dense, very narrow; silicles rather small (2 mm.), closely adpressed to rachis, oblong-subquadrate, apex emarginate, narrowly winged; style half as long as silicle; wings adherent to style.

First record: Galashiels, Selk., 1913, I. M. H. in *Rep. B.E.C.* iii. 309, (1913) 1914. One specimen only found on the shingle in October; height 13 cm.; scarcely a trace of foliage; fruits adpressed for the whole length of the slender stems, with cluster at base.

The specific name commemorates Aucher-Eloy, a botanist who made extensive collections in the Orient.

247 (16) *L. virginicum* L.

Britton & Brown *Ill. Fl. North. U.S., &c.*, ii. t. 1687.

N. America—in fields and along roadsides from Quebec to Minnesota, south to Florida and Texas; Mexico and West Indies. Adventive in Europe.

Very like *rudérale*, but usually a taller plant, the basal leaves obovate or spatulate in outline, less cut, and usually with a longer terminal lobe and many small lateral ones, all dentate; petals white, usually present; pod flat, orbicular or short oval, slightly winged above; cotyledons accumbent. In *apetalum* the petals

are very small or wanting, and the cotyledons incumbent. In *L. sativum* the oblong pod is winged all round.

First record for Tweedside: I. M. H. and G. C. D., 1917. In small quantity near the mills at Selkirk. Flowering September 1917.



Fig. 4.

LEPIDIUM AUCHERI Boissier.

247 (20) *L. bonariense* L.

Buenos Aires Pepperwort.

Thlaspi bonariense multiscissum flore invisibili Dillenius Hort. Eltham. 281, t. 286, f. 370. Fig. 5.

Minas Geraes, Brazil; Monte Video, Uruguay; Buenos Aires, Argentina; Cordillera de Coquimbo and Cordilleros de los Patos, Chile. See Thellung *Mon. Lepid.* 256, 1906.



Fig. 5.

LEPIDIUM BONARIENSE L.

A small, hardy, robust, rigid perennial, 15-40 cm., smooth, with an acrid, cressy taste; stem smooth; leaves pinnately multifid, very minutely ciliate; flowers with very inconspicuous linear setaceous petals, shorter than the caducous sepals; stamens 2-(4) and 4-(6); nectarial glands which, although very short, are distinct; fruiting raceme rather dense; pedicels erect-patent, as long as the silicles, which are elliptic or suborbicular, $3\frac{3}{4}$ mm. long by 2.5-3 mm. broad, the apex obtuse, scarcely angled; style short, apiculate; seeds yellowish-brown, 1.2-1 mm., semi-ovoid, compressed, nearly smooth, the margin with a narrow wing; embryo notorrhizus.

First found by I. M. H. by the side of the Tweed between Galashiels and Melrose, Roxb., September 1911. Noticeable for its handsome foliage. Flowering August to September, occasionally October. See *Rep. B.E.C.* 403, (1913) 1914.

Bonariense is the Latin name for Buenos Aires.

For var. *STUCKHERTIANUM* (*Rep. B.E.C.* 187, (1915) 1916) see *L. spicatum* Desv.

247 (21) *L. pseudo-didymum* Thellung, spec. nov. e grege Americano *Bipinnatifidorum*. Thell. Mon. Lepid. 193, 1906. *Rep. B.E.C.* iii. 308, (1913) 1914 and fig. Fig. 6.

Probably of S. American origin.

Annuum (?), fœtidum (odore *L. ruderale* L. referens). Radix tenuis, sed ramosa et multifibrosa. Caules complures, ascendentes, ad 20 cm. longi, cylindrici, pilis satis longis patentibus vel partim subreflexis hirsutuli, foliati, sparse ramosi, ramis patentibus elongatis et racemum terminalem longitudine subaequantibus; racemi in caule et ramis terminales, in eorum directione siti, sed ramis axillaribus longitudine adaequati. Folia basilaria ca. 4 cm. longa et 1 cm. lata, longe petiolata petiolo insertionem vix dilatato, bipinnatifidum, lobis et rhachi angustis sublinearibus, imprimis ad rhachin pilis longiusculis subsetiformibus pubescenti-hirsutula; caulina media et superiora $1\frac{1}{2}$ -2 cm. longa, plerumque simpliciter pinnatifidum lobis remotis linearibus plerumque integerrimis, rarius bipartitis, rhachi lineari (± 1 mm. lata) basi aequilata nec auriculata. Flores: sepala $\frac{3}{4}$ -1 mm. longa, anguste ovato-lanceolata, angustissime albo-marginata, subpersistentia; petala setacea, calycis longitudinis ca. $\frac{2}{3}$ aequantia, alba; stamina 2 mediana, glandulae 4 breves, triangulari-ovatae, calycis longitudinis $\frac{1}{6}$ - $\frac{1}{8}$ adaequantes. Racemi plurimi in ramis terminales (primus tamen basilaris e radice enatus); fructiferi elongati, satis laxi, flexuosi, axi striato, aequae ac caulis hirsutulo-pubescentes, pedicellis arcuato-subdeflexis, tenuibus, subteretibus, siliculae subaequilongis, sparse pubescentibus. Silicula late ovato-suborbiculata, $2\frac{1}{4}$ - $2\frac{1}{2}$ mm. longa et lata, basi late rotundata, apice anguloso-acutiuscula propter lobulos alares satis acutos, convergentes, utrinque subconvexa, medio secus replum subconstricta et inde leviter didyma, anguste et distincte (ad $\frac{1}{5}$ - $\frac{1}{6}$ longitudinis septi) emarginata,



Fig. 6.

LEPIDIUM PSEUDO-DIDYMU Thellung.

emarginaturae marginibus angulum acutissimum formantibus; stylus subnullus, stigma in fundo emarginaturae subsessile; valvulae carinatae, parte tertia superiore distincte alatae, reticulato-nervosae; septum sublineare (apicem versus vix dilatatum), stigmatibus sessilibus apiculatum. Semina fere semicircularia, compressa, fere laevia, immarginata (marginibus obtusis), flavo-brunnea, fere 1 mm. longa, fere $1\frac{1}{2}$ mm. lata; embryo notorrhizus, radícula apice marginem versus medianum seminis curvata, cotyledonibus leviter introrsum curvato-subplicatis.

Species valde similis speciebus nonnullis gregis *Bipinnatifidorum*, sed valde distincta silicula subdidyma septo fere lineari, valvulis distincte reticulatis et seminibus immarginatis. Habitu, indumento, forma foliorum, circumferentia siliculae et calyce persistente persimile *L. pubescenti* Desv. (Am. bor. occ. et austr. occ.), a quo tamen praeter characteres indicatos dignoscitur glandulis brevissimis nec calycis $\frac{1}{3}$ longitudine adaequantibus. *L. calycinum* Godr. (Am. austr. or.), quodammodo simile et affine glandulis brevibus, distinguitur indumento breviori, foliis caulinis basi dilatatis et (normaliter) \pm auriculatis, silicula elliptica vel obovata apice obtusa, superne subconcaeva. Silicula subdidyma reticulata, septo angustissimo et structura embryonis accedit ad genus "*Coronopus*," praesertim ad *C. didymum* (L.) Sm. (= *Lepidium didymum* L.), differt tamen seminibus maturis sponte e valvulis cadentibus, testa sub aqua mucilaginis et funiculo distincto. An species formae ancestrali communi generum "*Lepidium*" et "*Coronopus*" proxima?

Patria exacta ignota; species tamen certe ex America australi oriunda, semel in Europam introducta cum lanis exoticis.

First found by I. M. H. flowering in September on river shingle about one mile below Galashiels, Selk., 1913-1916. Not as yet recorded for anywhere else in the world. A new form of it was also discovered in September 1915 by I. M. H. which Dr Thellung described as forma *glomeratum* Thell., "racemis densissimis abbreviatis (1.2) $2\frac{1}{2}$ cm., longis pedicellis silicula subbrevioribus (septo subaequilongis), foliorum segmentis $\frac{1}{2}$ mm. tantum latis." This was a fully developed and heavily fruited plant.

247 (22) *L. calycinum* Godr. in Mém. Ac. Montp. i. 416, 1853.

Geographical area: South America.

Stem 1-2 dm., pubescent, erect, with spreading branches; leaves glabrous, the root leaves petiolate, lanceolate, toothed, the upper pinnatisect; flowers small; sepals patulate, hispid on the back, persistent on fruiting; stamens 6, four anther-bearing; stigma sessile; silicle broadly oval, glabrous, shining, the apex deeply and widely emarginate; seeds ovate, yellow.

This plant was first found in Europe at Port Juvenal, Montpellier, as a wool alien, and described by Godron (*l.c.*) and subsequently in the *Flora Juvenal*. ed. i. 8, et ii. 58, but its native country was then unknown.

First found in Britain by I. M. H. in 1909 and during successive years on the banks of the Gala, Selk., and the Tweed between Galashiels and Melrose, Roxb. See *Rep. B.E.C.* 16, (1916) 1917. Flowering August to September.

247 (23) *L. bipinnatifidum* Desv. Journ. de Bot. iii. 177, 1814.
South America.

Caule lignoso; ramis pubescentibus; foliis bipinnatifidis, sub-pubescentibus, sub-oppositis, pinnatifidis; siliculis sub-ovatis, emarginatis. Tige ligneuse, rameuse, rameaux divariqués, cylindriques, pubescentes; feuilles bipinnatifides, un peu pubescentes, pétiole comme ailé, divisions presque opposées, à trois ou cinq lobes profonds, comme penné; fleurs petites, blanches, comme ombellées, à calice très petit, et sépales linéaires; silicules disposées en épi court, peu nombreuses, à pédoncle double de leur longueur, à calice persistant; chaque silicule glabre est un peu rétrécie à la base, un peu moins au sommet et échancrée, sans conserver l'apparence du style; loges monospermes. Cette espèce paraîtrait avoir quelques rapports avec le *Lepidium divaricatum*, est très imparfaitement connue; d'un autre côté, elle a des rapports avec le *Lepidium Bonariense*; mais on n'aperçoit pas dans celui-ci le style allongé, existant au milieu de l'échancrure de la silicule du *Lepidium bipinnatifidum*. Desv., l.c.

Dr Thellung reports the specimens of above plant found by I. M. H. in the vicinity of woollen mills near the river Ettrick at Selkirk in September 1916 as new to Europe. See *Rep. B.E.C.*, l.c.

247 (24) *L. spicatum* Desv. Journ. de Bot. iii. 178, 1814.
L. racemosum Griseb.

Extreme south of S. America, in Patagonia—Estrecho de Magellanes.

Caule erecto, ramis simplicibus; foliis linearibus, acutis, integris, glabris, sub-adpressis; siliculis orbiculatis, sub-imbricatis, emarginatis. Tige herbacée, annuelle (!), droite, à rameaux simples; feuilles linéaires, aiguës, entières, glabres; comme appliquées sur la tige; silicules comme imbriquées, disposées en longs épis; ayant une forme circulaire et une échancrure un peu arrondie au sommet, dépourvue de style saillant. Cette plante, de laquelle je n'ai vu qu'un seul exemplaire dans l'Herbier du Museum de Paris, a quelques rapports avec le *Lepidium virginicum*, mais elle est bien distincte par la position de ses silicules. Desv., l.c.

At first, the specimen being defective, Dr Thellung was inclined to refer the plant to a variety of *bonariense*, but having grown it from seed, is now able to say it is the above species.

First record as *L. bonariense*, var. *Stuckhertianum*, Galashiels, Selk., I. M. H. in *Rep. B.E.C.* 187, (1915) 1916. First record for Europe. Found on banks of Tweed near Galashiels, Selk., and also at Melrose, Roxb. Flowering August to September. Rare.

247 (30) *L. hyssopifolium* (Desv.) Thell. Mon. Lepid. 304, 1906.

Desv. in Journ. de Bot. iii. 164 and 179, 1814, ex p. DC. Syst. ii. 545, 1821; Prod. i. 206, 1824. *L. ruderale* Benth. Fl. Austral. i. 86, 1863, ex p., non L.

S. and E. Australia—Hawkesbury, New South Wales (*Ferd. Bauer*), orig. in *Herbb. Paris and Vienna*; Victoria (*R. Brown*); Adelaide, South Australia (*F. von Mueller*, 1852).

Verisim. perenne (partes basilares non vidi). Caulis suberectus, fere cylindricus (leviter anguloso-striatus), glaberrimus et subnitidus, ramosus, ramis saepissime erecto-patentibus, rigidis, in racemos abeuntibus. Folia caulina lineari-lanceolata vel linearia, utrinque acuta, basi in petiolum attenuata, praesertim apicem versus remote serrata, subglaberrima (nonnisi basi petioli pilis paucis brevibus cylindricis obtusiusculis minutissime ciliata et interdum ad margines pilis remotissimis ejusdem formae obsita). Flores: sepala ovata, albo-marginata, caduca; petala calyce breviora et multo angustiora, lineari-oblonga vel fere setacea; stamina 2(-4) mediana; glandulae 4(-6) breviter cylindricae, calycis ca. $\frac{1}{6}$ - $\frac{1}{5}$ longitudine aequantes. Racemi fructiferi valde elongati, laxi, apicem versus attenuati, axi satis crasso rigido apice attenuato, leviter sulcato-striato glaberrimo subnitido, pedicellis modice gracilibus fere rectis leviter angulosis glaberrimis, erecto-patentibus ($45-60^\circ$), inferioribus quam silicula longioribus, superioribus ei subaequilongis. Silicula rhombico-ovata, modice compressa, basi propter margines fere rectos acutiuscula, apice circumferentia anguloso-acuta, distincte et satis acute emarginata marginibus angulum fere rectum formantibus, dentibus alaribus triangulari-acutiusculis latitudine ipsorum vix brevioribus, porrectis vel (in silicula juniore) leviter divergentibus; stylus quam emarginatura brevior, stigmate marginem anteriorem siliculae non attingente; valvulae carinatae, apicem versus anguste alatae; septum oblanceolatum (1:4) stylo, brevi apiculatum. Semina anguste ovoidea (1:2), modice compressa, fere laevia, immarginata, fusco-rufa; embryo notorrhizus.

"The pieces before me are 20-30 cm. long; the entire plant is probably considerably taller. Stem leaves 2-3 cm. long, 2-3 mm. broad; calyx $\frac{3}{4}$ mm. long; fruit mostly 3 mm. long, 2 mm. broad; breadth of wing at apex about $\frac{1}{3}$ mm.; seed $1\frac{1}{2}$ mm. long, $\frac{3}{4}$ mm. broad. Desvaux describes the plant as hairy ('tige pubescente, pulvérulente'), De Candolle on the other hand as glabrous. This difference arose from the fact that in Desvaux' herbarium, by the side of a specimen of the glabrous plant from Hawkesbury which with De Candolle I name *L. hyssopifolium*, there are two specimens of a hairy species which I designate as *L. Desvauxii*, n. sp. Now, although Desvaux' description was evidently drawn up from the hairy species, yet I agree with the conception of De Candolle, who sees in the plant from Hawkesbury the type of *L. hyssopifolium* Desv., and De Candolle's work is of course far more widely known than the seldom consulted work of Desvaux. De Candolle's view is in my opinion perfectly

allowable, inasmuch as the glabrous plant actually lies in Desvaux' herbarium under the name of *L. hyssopifolium*."—Å. Thellung.

First found in Britain by I. M. H., 1913. See *Rep. B.E.C.* iii. 309, (1913) 1914. Exhibited at the Linnean Society April 2, 1914. On banks of Tweed about two miles below Galashiels, Roxb., occasionally attaining a height of 6 dm. Not of frequent occurrence. Flowering August to September.

Ferdinand Bauer, the artist who painted the flowers for Sibthorp's *Flora Græca*, discovered this species in Australia.

247 (31) *L. sagittulatum* Thell. Mon. Lepid. 305, 1906.

L. ruderale Benth. Fl. Austral. i. 86, 1863, ex p., non L. Fig. 7. Australia—Warrego River, Queensland, 1885, Bêche in *Herb. Berlin*.

Perenne? Radix satis crassa, collo rudimentis membranaceis foliorum delapsorum vestita. Caulis erectus, striato-sulcatus, glaberrimus, foliatus, ramosus, ramis suberectis in racemos abeuntibus. Folia glaberrima; caulinarum majora e basi sessili sagittato-auriculata lanceolato-subulata acuta integerrima (semper?); minora majoribus similia sed basi non vel vix auriculata. Flores: sepala ovata, albomarginata; petala nulla; stamina 2 mediana; glandulae calycis $\frac{1}{4}$ – $\frac{1}{3}$ longitudine adaequantes, lineari-lanceolatae. Racemi fructiferi elongati, laxi, axi satis crasso striato-sulcato glaberrimo, pedicellis gracillimis subteretibus glabris, e basi suberecta leviter extrorsum arcuatis, siliculae subaequilongis. Silicula elliptica, utrinque obtusiuscula, apice levissime et satis obtuse emarginata, lobulis alaribus in utroque latere brevibus obtusissimis porrectis, stylo (cum stignate) emarginaturam longitudine aequante; valvulae carinatae, apice angustissime alatae, fere laeves, subnitidae; septum oblanceolatum, stylo brevissimo apiculatum, inferne transversim rugosum. Semina anguste ellipsoidea, compressa, fere laevia, immarginata, flavo-fusca; embryo notorrhizus.

20-30 cm. high; larger stem leaves $1\frac{1}{2}$ –2 cm. long, at the base $1\frac{1}{2}$ – $2\frac{1}{2}$ mm. broad; calyx $\frac{1}{2}$ – $\frac{3}{4}$ mm. long; fruit $2\frac{1}{2}$ mm. long, $1\frac{1}{2}$ mm. broad; seed $1\frac{1}{4}$ mm. long, $\frac{3}{4}$ mm. broad.

Siliculis ellipticis (non rhombicis) simile *L. pseudo-ruderali* Thell., sed foliis e basi sagittata lanceolato-subulatis (non e basi angustata oblanceolato-obovatis) diversum. Siliculae et racemorum forma etiam *L. divaricatum* Soland. (Afr.) refert, sed petala nulla, folia caulina basi non attenuata sed subsagittata, pedicelli graciliores leviter tantum arcuati, etc.

First found in Britain by I. M. H., 1913. See *Rep. B.E.C.* iii. 309, (1913) 1914. Exhibited at the Linnean Society April 2, 1914. Found flowering from August to October very freely alike in yard of Galashiels Skin-works and on the banks of the Gala, also from its junction with the Tweed for two miles, Selk. and Roxb. Out of a number of specimens submitted to Dr Thellung he labels one "*Acced. ad fasciculatum* Thell."



Fig. 7.

LEPIDIUM SAGITTULATUM Thellung.

247 (32) *L. fasciculatum* Thell. Mon. Lepid. 306, 1906.*L. ruderale* Benth. Fl. Austral. i. 86, 1863, ex p., non *L.*S. and E. Australia; Swan Hill, Victoria, as *runderale* F. v. Mueller in *Herb. Petrograd*.

Valde affine *L. sagittulato* Thell. et ejus forsan forma pathologica. Perenne? Caulis suberectus, satis rigidus, ut rami leviter anguloso-striatus glaberrimus nitidus, ramosus, ramis foliatis pseudo-dichotome ramosissimis ramulis suberectis in racemos abeuntibus; racemi primum terminales, sed propter ramos axillares magis auctos fastigiatis denique ex maxima parte foliis oppositi. Folia e basi sessili sagittata lanceolato subulata acuta, apicem versus inciso-serrata vel integerrima, glaberrima. Flores: sepala ovata, albo-marginata; petala nulla; stamina 2 mediana; glandulae calycis $\frac{1}{3}$ longitudine aequantes, e basi triangulari lineari-lanceolatae apice quasi leviter incrassatae. Racemi fructiferi plerique folio oppositi, corymboso-capitati, fere hemisphaerici, axi subnullo, pedicellis satis rigidis leviter angulosis glaberrimis, inferioribus siliculae subaequilongis arcuato-patentibus, superioribus ea brevioribus suberectis. Silicula obovata, basi longe attenuata marginibus subconcavis, apice rotundato-obtusa, levissime emarginata marginibus fere parallelis, stylo quam emarginatura subbreviora, lobulis alaribus obtusis convergentibus; valvulae carinatae, apicem versus angustissime sed distincte alatae, fere laeves subnitidae; septum oblanceolatum, stylo brevissimo apiculatum, basi transversim rugosum. Semina anguste ovoidea, compressa, sublaevia immarginata, fulvo-fusca; embryo notorrhizus.

Quite 30-50 cm. high, copiously branched with moderately erect branches; stem leaves $1\frac{1}{2}$ -2 cm. long, at the base mostly 3 mm.

Extr. Thellung Mon. Lepid. 279.

26* Silicula \pm rhombica aut, si elliptica vel obovata, folia basi \pm sagittato-auriculata.

27 Caules et folia glaberrima vel folia margine pilis perpaucis cylindricis obsita.

28 Folia caulina basi angustata. Silicula rhombico-ovata. Petalorum rudimenta plerumque praesentia.—S. Austr., Victoria, N.S. Wales.

112 *L. HYSSOPIFOLIUM* Desv.

28* Folia caulina basi \pm sagittata vel cordata. Petala nulla. Glandulae elongatae. Septum basin versus transversim rugosum.

29 Racemi fructiferi elongati. Silicula elliptica, basi obtusiuscula vel acutiuscula.—Queensland.

113 *L. SAGITTULATUM* Thell.

29* Racemi fructiferi corymboso-abbreviati. Silicula obovata, basi longe attenuata marginibus subconcavis.—Victoria.

114 *L. FASCICULATUM* Thell.

broad ; calyx $\frac{1}{2}$ – $\frac{3}{4}$ mm. long ; fruit 3 mm. long, nearly 2 mm. broad ; seed $1\frac{1}{4}$ mm. long, $\frac{2}{3}$ mm. broad.

The characteristic feature of the pseudo-umbellate, abbreviated fructification gives one almost the impression of a diseased condition. The other distinguishing character from *L. sagittulatum* Thell., the wedge-like narrowing form of the fruit at the base, accords well with the restricted space-relations owing to the thick bunchy grouping of the fruit.—A. Thellung, *l.c.*

First found in Britain by I. M. H. in 1913. See *Rep. B.E.C.* iii. 309, (1913) 1914. Exhibited at the Linnean Society, April 2, 1914. Abundant on the shingly margin of the Tweed from Galashiels, Selk., to Dryburgh, Roxb. (9 miles). Very noticeable for its long slender sprayed stems, crowned with minute clusters of fruit. Flowering in September and occasionally in October.

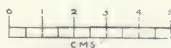


Fig. 8.

LEPIDIUM OXYTRICHUM Sprague.

247 (33) *L. papillosum* F. von Mueller in *Linnaea* xxv. 370, 1852. New South Wales, Victoria, S. Australia.

A small, erect, branching annual, 1.5-3 dm. ; stems covered with little transparent papillae, and exhaling an unpleasant scent ; leaves toothed, upper auricled, glabrous, lanceolate or linear-cuneate ; flowers very small, apetalous ; stamens 4 ; racemes 5-10 cm., with rigid, flattened, rather spreading pedicels ; pod obovate, valves winged only above the middle, forming two round terminal lobes, with the stigma sessile in the narrow sinus ; seeds exuding abundance of a viscid, clear mucilage. Benth. *Fl. Austral.* i. 86.

First found in Britain, in Selkirk, by I. M. H., in 1916, and determined by Dr Thellung. The *L. papillosum*, *Rep. B.E.C.* 152, 1912, is *L. oxytrichum* Sprague.

247 (34) *L. oxytrichum* Sprague in Kew Bulletin 123, 1915.

L. papillosum Thellung in *Rep. B.E.C.* 152, 1912, not of F. v. Mueller. See *Mon. Lepid.* 276, 288, 1906. Fig. 8.

S. Australia, between Stokes Range and Coopers Creek, with *L. papillosum* ; W. Australia ; Mt. Brown, New South Wales.

This differs from *papillosum* in the densely hirsute stems and branches, with slender, linear, subulate hairs. The sinus at the apex of the silicle is triangular.

First record for Britain as *L. papillosum*, Galashiels, Selk., 1909, I. M. H. and G. C. D. in *Rep. B.E.C.* 152, (1912) 1913, and 187, (1915) 1916. On the shingle near the junction of the Gala and the Tweed ; found also in subsequent years in September as well as August in flower and fruit. Exhibited at the Linnean Society April 2, 1914.

247 (35) *L. peregrinum* Thellung (nova species) in *Rep. B.E.C.* 153, (1912) 1913. Fig. 9.

Certain origin unknown, probably from Australia.

Section *Dileptium*, sub-section *Eudileptium*, grex *Pseudo-ruderalia* Thellung.

Perenne? Caulis suberectus, elatus, fere cylindricus (leviter anguloso striatus), glaberrimus, subnitidus, foliosus (foliis inferioribus saepe fasciculatis), ramosus. Folia caulina lanceolata utrinque attenuato-acuta, acute serrata serraturis adpressis, margine (praesertim basi) pilis gracilibus cylindricis acutis minute ciliata, ceterum glabra. Racemi sparsi, in ramis laterales, folio oppositi, satis multiflori. Flores minuti ; sepala anguste ovato-elliptica, albo-marginata, dorso pilis longiusculis villosula, satis diu persistentia ; petala rudimentaria setacea, calyce breviora ; stamina 2-(4) mediana ; glandulae 4-(6) triangulari-lanceolatae, calycis ca. $\frac{1}{8}$ longitudine aequantes. Racemi fructiferi satis breves, axi glaberrimo vel apicem versus minute et



Fig. 9.

LEPIDIUM PEREGRINUM Thellung.

remotissime puberulo, leviter anguloso-striato, pedicellis gracillimis subcapillaribus, latere interiore pilis brevissimis (diametro pedicellorum brevioribus) puberulis, leviter extrorsum arcuatis. fere horizontalibus vel subdeclinatis, silicula $1\frac{1}{2}$ -2-plo longioribus. Silicula ovata, modice compressa, basi obtusiuscula, apice circumferentiæ anguloso-acuta, distincte et satis acute emarginata marginibus emarginaturæ angulum fere rectum formantibus. dentibus alaribus in utroque latere triangulari-acutis porrectis; stylus brevissimus, stigma in fundo emarginaturæ sessile; valvulae carinatae, apicem versus anguste alatae; septum oblanceolatum (1:4-5), stylo brevissimo cum stigmate apiculatum. Semina minutissima, angusta ovoidea (1:2), anguste compressa fulvo-fusca, fere laevia (leviter scrobiculata) immarginata; embryo notorrhizus. Rami (tantum suppetentes) ca 40 cm. longi; folia 3-4 cm. : 3-7 mm.; sepala $\frac{1}{2}$ - $\frac{2}{5}$ mm. longa; silicula 2:1 $\frac{1}{3}$ mm.; semen 1: $\frac{1}{2}$ mm. Species affinis nonnullis speciebus australiensibus, ex grege *Pseudo-ruderalium*, praesertim *L. hyssopifolio* Desv. em. DC., quod tamen differt racemis terminalibus nec lateralibus, pedicellis glaberrimis, floribus et fructibus majoribus, silicula distincte rhombica multo majore, quam pedicellus haud conspicue brevior: *L. pseudo-ruderalis* Thellung, dignoscitur caule et foliis pubescentibus, racemis terminalibus, foliis \pm oblongo-obovatis obtusiusculis, pedicellis brevioribus silicula elliptica obtusiuscula levius emarginata: *L. Merralli* F. v. Muell. (mihi ex descr. tantum notum) differre videtur statura pumila (7-12 cm.), foliis linearibus integris vel in lobos paucos angustos productis, silicula rhomboideo-orbiculari levissime emarginata obtusiore. *L. divaricatum* Soland. (spec. Africana) quodammodo simile (praesertim sub-sp. *linoides* Thell.), distinguitur pedicellis brevibus (siliculae subaequilongis) e basi suberecta extrorsum curvatis et silicula angustiore obtusa levius emarginata.—A. Thellung.

Discovered at Galashiels, Selk., by I. M. H., 1910. See *Rep. B.E.C.* 153, (1912) 1913. On overhanging bank amid native herbage and on river shingle on the Gala at its junction with the Tweed. Flowering August to September. Rare. Exhibited at the Linnean Society April 2, 1914.

This is of special interest, since at present the plant has not been recorded from its native country, which is most probably the Australian Continent.

66 VOGELIA Med. Pflanzengatt. 32, 1792, t. i. f. 6, not of Lamarck or Gmelin.

Neslia Desv. in Journ. de Bot. iii. 162, 1814.

A monotypic genus of the Mediterranean area and central Europe, extending in Asia to the Punjab, Egypt, etc. It has a wingless, flattened, round fruit and awn-like style. Named after Benedict Christian Vogel, a professor at Altdorf.

258 **V. paniculata** Hornem. Hort. Hafn. ii. } *Ball Mustard* (N.A.).
594, 1815.

Neslia paniculata Desv. *Myagrum paniculatum* L. Weed Fl. of Iowa 163, f. 91.

Usually in disturbed ground in all Europe except the extreme north, but mostly adventive except in the Mediterranean region. In Persia, Afghanistan, Beluchistan, Punjab up to 2000 metres, Egypt. Adventive in N. America—Ontario, British Columbia, Manitoba, and on ballast at the eastern ports; known since 1848.

A single-seeded annual, 3-10 dm.; stem and leaves clothed with a short, rough pubescence; leaves oblong, 2.5-10 cm. long by 2 cm. or less wide, sagittate; flowers bright yellow in a long (3-18 cm.) raceme; pedicels spreading; silicles 2 mm. broad, spherical, normally two-celled, but usually one abortive; seed small, yellow, often remaining in the entire silicle; cotyledons incumbent. It is doubtless the rough coat of the silicle which in most instances attaches itself to the fleece, although the seeds may also adhere to the greasy wool. *Vogelia* is also introduced with grain or fowl food.

First record: *Neslia paniculata*, Tweedside, Kelso, Roxb., A. Brotherston in *Proc. Berw.* 136, 1873. Found by I. M. H. and G. C. D. at Galashiels, Selk., in July 1910; also by I. M. H. a few miles further down the river, Roxb., in September 1910. Flowering July to September.

Brotherston also noticed it as a weed in a brewery garden at Ednam, Roxb., in 1867.

70 BUNIAS (Tourn.) L.

A small genus of about 7 [5 D.T.] species of yellow-flowered biennials or perennials, with large leaves and one pendulous seed in each loculus, the incumbent cotyledon being circinate-convolute. They are natives of Europe and Asia, one being Chinese. Linnaeus says the name is derived from the Greek word for a hill.

265 **B. orientalis** L.

In cultivated areas in Austria eastwards, but often adventive in Denmark, France, Belgium, Holland, Britain, Scandinavia, etc. In Caucasus, Taurus, Armenia, Persia, Afghanistan, Beluchistan.

A tall, coarse perennial, 8-12 dm.; stem clothed with hairs having black bases; flowers bright yellow; sepals spreading; petals obovate, entire; silicles bilocular, subverrucose.

First record: I. M. H., August 1909, on the banks of the Tweed at Melrose and five miles further on at Dryburgh, Roxb. In flower July to September. Det. A. Thellung.

The Cruciferae, with the exception (and it is a striking one) of *Lepidium*, are not richly represented in the lanal flora of Tweedside.

7 RESEDACEAE DC.

A small family of about 6 genera of 80 annual, biennial or perennial species, rarely shrubby, mostly found in the Old World and chiefly in the Mediterranean region, extending through Asia to China. A few occur in South Africa. The hermaphrodite or rarely unisexual flowers are usually arranged in a racemose or spicate inflorescence, one-bracted, with persistent 4-7-partite calyx with imbricate segments; the petals 4-7, rarely 2 or absent, entire, or 3-or pluri-partite; stamens 3-40, perigynous; anthers two-celled, introrse; fruit capsular, closed or open at apex, rarely baccate or follicular; leaves scattered or fascicled, simple, trifid, or pinnatipartite.

79 RESEDA (Tourn.) L.

This genus, of which about 70 species have been described, chiefly belongs to the Mediterranean region, extending across Asia to China. The name is a Latin word used by Pliny and is derived from *resedo*—to calm or assuage, from the supposed demulcent properties. The species are of annual, biennial or perennial duration. The well-known Sweet Mignonette and the Weld, once extensively used for dyeing, belong to it. The genus is characterised by its divided sepals, 4-7-partite; petals 4-7, unequal, bi- or multifid; stamens 10-40; capsule indehiscent, three lobed at apex.

284 *R. lutea* L.

Wild Mignonette, Base Rocket.

Syme E. B. ii. t. 162.

Native of south Britain and of Europe except the extreme north of Scandinavia, Algeria, Morocco, Persia, Palestine. Adventive in North America, New Zealand, &c.

Stem with many ascending branches; leaves divided about the middle into three narrow, entire or cut lobes; flowers pale yellow in a rather short and dense conical inflorescence; petals 6, the two lower entire, the upper cut; stamens 12-20.

On Tweedside it is probably a wool-alien of very sporadic occurrence. Recorded from the mouth of the Gala by A. Brotherston in *Proc. Berw.* 137, 1873, and from waste places, Spittal Links, Northumberland, in Johnston *Fl.* 281, 1831.

12 CARYOPHYLLACEAE Reichb. = ALSINACEAE.

A large family of about 1500 species and 80 genera dispersed over the globe, but rare in the tropics except on high mountains. Few species are of commercial importance. Many of our favourite garden plants belong to it, including *Dianthus*, *Silene*, *Lychnis*, *Cerastium* and *Gypsophila*. It consists of herbaceous species, rarely woody at the base, with opposite, entire leaves; swollen nodes; a dichasial inflorescence; sepals and petals 4-5; stamens 5-10; styles 2-5; fruit usually capsular, dehiscent by as many or twice as

many valves as there are styles. The name is derived from *Caryophyllus*, the Clove Pink. It is, however, more correct to use the name *Alsiniaceae* since there is no genus *Caryophyllus* now valid in this family.

88 SAPONARIA L.

A genus of about 35 species [20 D. T.] mainly confined to Europe, northern and central Asia, one species occurring in the Chilean Andes. It differs from *Silene* in the 10 stamens and from *Gypsophila* in the many-nerved calyx which is not turbinate. It includes a few favourite garden plants. The name is derived from *sapo*, as the leaves of *S. officinalis* yield a soap-like lather.

331 *S. Vaccaria* L.

Cow Herb (U.S.A.).

Vaccaria vulgaris Host. *V. parviflora* Moench. *V. pyramidata* Medik. *V. segetalis* Garcke. Reichb. Ic. vi. f. 245. Bot. Mag. t. 2290.

In cultivated ground or in clayey or calcareous soils throughout Europe (except Britain, Scandinavia, and N. Russia, where it is often adventive), Siberia, Mesopotamia, Asia Minor, Persia, Turkestan, Beluchistan, Assyria, China; in wheat fields throughout India, Tibet, Arabia, Egypt, Algeria, Morocco, Canaries. Adventive but naturalised in N. America from Ontario to British Columbia south to Florida and Louisiana; also in the Rocky Mountain region and New Zealand.

A pretty and distinct-looking annual, with glaucous, glabrous, oblong, one-nerved leaves, narrowed at base, the upper leaves lanceolate-acuminate and cordate or connate at base; panicle fastigiate, of long-stalked, bright rose-pink flowers; calyx ovate, pyramidal, with five strong angles, distinctly winged in fruit; seeds rather large, black, kidney-shaped. Often introduced with corn and chicken food, but probably here it is a wool-alien.

First record for Tweedside: I. M. H. in 1910. Flowering from July to September in successive years at the junction of the Gala and Tweed, Selk., and between Galashiels and Melrose, Roxb. A showy plant of strong growth, attaining a height of 6 dm.

The Soapwort, *Saponaria officinalis* L., occurs in Tweedside as a garden escape.

89 SILENE L.

A large genus, of which over 400 species have been described [480 Dur.], known from the remainder of the family by having three styles and the capsule plurilocular at the base. The flowers are solitary or cymose, often secund on the branches of the cyme. These annual or perennial herbs are chiefly natives of Europe and temperate Asia, and include many garden species. The name is said to be derived from *silaon*—saliva, from the viscid secretion in the inflorescence of some species.

340 S. noctiflora L.*Night-flowering Catchfly.*

Syme E. B. ii. t. 209.

All Europe except the extreme north, W. Asia, Siberia, Caucasus, Taurus, Armenia, Persia.

A somewhat viscid, erect, dichotomous plant with oblong-lanceolate, acute leaves; capsule ovate, conical; petals yellowish-pink, rolled up in daytime, but open and fragrant at night. It resembles *Lychnis alba* in appearance.

First record: Occasionally on Tweedside, A. Brotherston in *Proc. Berw.* 251, 1876. Galafoot, Selk., I. M. H. in *Tr. Bot. Soc. Edin.* 40, 1909. Still plentiful.

341 (3) S. nocturna L., var. brachypetala Benth. Cat. Pl. Pyr. 122, 1826.

S. brachypetala Rob. et Cast. in DC. Fl. Fr. v. 607. Reichb. Ic. vi. f. 5058.

In waste, sandy and cultivated places, Portugal, Spain, S. France, Italy, Dalmatia, Greece, Turkey, Cyrenaica, Syria, Arabia, Egypt, Algeria, Tunis, Morocco, Canaries. Adventive in New Zealand, in the North Island.

A very variable species of which the type has not as yet been found in this area. The variety is kept as a distinct species on p. 59 of Williams' *Monograph*. The type is an inconspicuous plant, but this has even smaller petals, which are included in the calyx, of a whitish colour, narrow, cuneate, with an emarginate apex and an included capsule; filaments glabrous; capsule oblong, without a carpophore. The plant is scabrid and viscid, the leaves lanceolate-spathulate, mucronate, the bases of the lower leaves often strongly ciliate.

First found in Britain in 1913 by I. M. H. See *Rep. B.E.C.* iv. 10, (1914) 1915. Abundant on the shingle by the Tweed for one to two miles below Galashiels, Selk. and Roxb. A slender plant, 10-15 cm. high. Flowering August to September. Det. A. Thellung.

342 S. gallica L.*Gunpowder weed* (S. Africa).

Reichb. Ic. f. 5054, 5055. Williams' *Mon.* 57.

In sandy places, fields, vineyards, cultivated and waste ground. Native in the central and southern parts of Europe, and scattered through all the countries except Britain, Scandinavia, and N. Russia, in which it is only adventive. In W. Asia, India, N. Africa, Egypt, Canaries, and a pest in S. Africa. and also adventive in America. Abundant throughout New Zealand, S. Australia, where it was introduced in 1855 and is now "a troublesome weed." Abundant in California and doubtless conveyed by merino sheep to a height of 2800 metres in the Andes of Bolivia and Chile.

A variable, viscid annual, with oblong, spathulate, lanceolate leaves, glandular-pubescent calyx with green and red lines, small pinkish petals, and small black tuberculated seeds, resembling grains of gunpowder, hence the Cape name. The viscid inflorescence easily adheres to animals, and thus the plant rapidly extends its area, although it is likewise spread by the operations of man.

First record: I. M. H., Galafoot, in *Tr. Bot. Soc. Edin.* 40, 1909. Growing freely on an island near the mouth of the Gala, Selk., and also on the banks of that stream and on the Tweed towards Melrose, Roxb. Flowering July to September.

344 *S. quinquevulnera* L.

Syme E. B. ii. t. 203. Reichb. Ic. vi. f. 5054.

In similar localities, but with a more local distribution than *gallica*, with which many botanists unite it. The plant, however, differs markedly in the smaller and paler petals, each of which has a blackish crimson spot at the base, hence the Latin name from the five wounds. The plant, too, is usually more strict with narrower leaves. This species appears to be native in the Channel Isles, and is sporadically adventive in a few localities in the south of England.

First record for Tweedside: I. M. H. On the banks of the Gala below Galashiels, Selk., September 1911.

345 *S. pendula* L.

Curtis Bot. Mag. t. 114. Williams' Mon. 69. Reichb. Ic. vi. f. 5070.

Portugal, Italy—the Alban Hills and Naples, Crete, Cyprus, Asia Minor, Djurdjura Mountains in Algeria.

An attractive annual, introduced into British gardens before 1736, with flesh-coloured, axillary, pendulous flowers and inflated calyx. The leaves are ovate-lanceolate, pubescent.

First found at Galafoot, Selkirk, by I. M. H. in 1914. It possibly owes its occurrence on the Tweed to gardening operations. Det. A. Thellung.

349. *S. rubella* L., emend. Brot. Fl. Lusit. ii. 188, 1804.

Viscago lusitanica, *flore rubello vix conspicuo* Dillen. Hort. Eltham. 324, t. 314, f. 400. Reichb. Ic. vi. f. 5078. Williams' Mon. 113.

In fields, vineyards, sandy and cultivated ground in Portugal, Spain, Italy, Sardinia, Sicily, Algeria, Morocco, Rhodes, Cyprus, Syria, Mesopotamia, Tunis, Egypt.

A rather pretty, pale green annual, 3-5 dm., puberulous but not viscous, the leaves attenuated at base, glaucescent, ciliate, obovate-spathulate to linear-obtuse; limb of flowers rose-coloured, obovate-

cuneate, retuse, with yellow anthers; capsule ovate-cylindric, 2-3 times longer than carpophore; seeds more or less compressed.

First record: I. M. H. in *Tr. Bot. Soc. Edin.* 40, 1909. Found on the banks of the Gala nearly a mile below Galashiels, Selk., August 1908. Flowering August to September.

349 (2) *S. inaperta* L.

Reichb. Ic. vi. f. 5073. Williams' Mon. 125.

In dry, stony and sandy places in Portugal, Spain, S. France, Corsica, Algeria, Canaries, Madeira.

A curious, pale green annual, with very short rosy petals (sometimes absent) which are much shorter than the calyx; leaves narrow, linear, subulate, rigid.

First record: Galashiels, Selk. and Roxb., I. M. H. in *Rep. B.E.C.* 403, (1913) 1914. Found among herbage on shingle by Tweed-side, Selk., one to two miles below Galashiels, Roxb. A slender-stemmed plant, 13-18 cm. high. Flowering August to September.

99 POLYCARPON Loebl. It. 7, 1758, as *Polycarpa*.

A small genus of about 12 species [6 D. T.] distinguished from the Alsinoideae by the styles being connate at the base. The name is given from *poly*—many, and *karpos*—fruit.

416 *P. tetraphyllum* L.

Mollugo tetraphylla L. Syme E. B. ii. t. 258. Sibth. Fl. Graeca t. 102.

By roads, in sandy and stony places, often near the sea, but occurring rarely in mountainous tracts of Sierra Madrona in the province of Almaden in Spain, ascending to nearly 1000 metres. Native on south coast of England, Channel Isles, Portugal, France, Italy, Dalmatia, Hungary, Transylvania, Greece, Canaries and Egypt. Throughout Cape Colony, Natal; in Chile, &c. Adventive and abundant in New Zealand.

A small, annual, prostrate, dichotomously-branched plant with oblong spatulate or obovate, opposite or verticillate leaves; flowers small, inconspicuous, in terminal dichotomous cymes, with scarious stipules and bracts; mucronate sepals; notched petals, shorter than sepals; 3-5 stamens; stem and pedicels minutely papillate. The whole plant is often tinged with purple, but when growing in shady places is normally green.

First record: Not far from the mouth of the Gala, Selk., J. Stuart 1868. See *Proc. Berw.* 79, 1869. There in 1874. See *Proc. Berw.* vii. 251. Found also in garden ground at Darnick, Roxb., by Mrs Jerdon, *l.c.* Found by I. M. H., flowering in July and August 1912 and in successive years, on shingle near the junction of the Gala and the Tweed, Selk., and on the banks of the Tweed

for a mile further on, Roxb. Specimens more stunted and less branched than those seen in Jersey and Sark.

17 MALVACEAE Adanson 1763 ; Jussieu 1789.

A large and important family of about 800 [Dur.] species and 64 genera, dispersed over all except the coldest regions of the world, represented by herbs, shrubs, or soft-wooded trees. It affords many striking, large-flowered garden plants, usually purple, red, or yellow, such as the Hollyhocks, Tree-Mallows, *Hibiscus* and *Abutilon*, while it contains such important economic plants as the cotton-yielding *Gossypium*. From plants of the different-looking Tiliaceae and Sterculiaceae the one-celled anthers afford a distinguishing character. No other natural families have a valvate calyx.

109 MALVA (Tourn.) L.

A genus of about 30 species, confined to the temperate areas of the Old World, but carried adventitiously to most settled districts of all the continents. The genus has a staminal column bearing stalked anthers at the top and a free epicalyx ; the flowers are often showy, purplish-rose or white (never yellow), axillary, solitary or fasciculate, emarginate, rarely denticulate, sessile or stalked. The name is the Latin word for the plant, said to have come from the Greek *malache* —to soften, many species being demulcent, or from the softness of the leaves of some species included under that name.

452 (2) *M. nicaeensis* All. Fl. Pedem. ii. 40, 1785.

Reichb. Ic. v. f. 4838.

S. and E. Europe, Portugal, France, Italy, Dalmatia, Herzegovina, Montenegro, Greece, Turkey, Caucasus, Syria, Palestine, Persia, Beluchistan, Tunis, Algeria, Morocco. Often adventive elsewhere.

A hairy annual ; flowers fascicled ; outer calyx of broadly lanceolate or oval segments ; corolla small, bluish, as long or twice as long as calyx ; petals barbed at the narrowed base ; carpels not toothed on border, which is reticulate-rugose.

First record for Tweedside : I. M. H., August 1916. Found in the vicinity of woollen mills at Selkirk from August to October.

454 *M. pusilla* L.

M. minor flore parvo caeruleo Dill. Ray Syn. 251, 1724. *M. borealis* Wallm. *M. parviflora* Hudson & Smith, not of L. Syme E. B. ii. t. 283. Reichb. Ic. v. f. 4835.

In waste places, waysides, cultivated ground in Scandinavia, Finland, Germany, Austria, Hungary, N. Italy, Serbia, Transylvania, Russia, Siberia, Transcaucasus, India--Bengal, Mysore ; N. America—California.

An annual species, with decumbent stems; leaves roundish, deeply cordate at base, with 5-7 crenate-serrate lobes: the three leaves forming the epicalyx are as long as the calyx; petals very short, with the claw barbed, not exceeding the calyx, which has glabrous lobes only ciliated on the margin; carpel-margins reticulate-rugose, with short hairs. The general aspect of the plant is that of *M. rotundifolia*, with which indeed Linnaeus confounded it.

First found on the shingle at Galafoot and near the Skin-works, Galashiels, Selk., I. M. H., 1916. Flowering August to September.

458 *M. parviflora* Höjer in L. Amoen. Acad. iii. 416, 1756, not of Withering.

Reichb. Ic. v. f. 4833.

In ditches, on roadsides, &c., Portugal, Spain, S. France, Italy, Dalmatia, Greece, Transcaucasus, Beluchistan, Persia, India, Afghanistan, Palestine, Egypt, central Arabia, Morocco, Canaries, Madeira. Adventive in Cape Colony. An abundant alien in New Zealand.

An annual with slightly stellate hairy stems; leaves cordate, orbicular, palmately nerved, feebly lobed; petals about 3 mm. long, pale-bluish, obovate, slightly emarginate, the claw glabrous; carpels hairy or glabrous, transversely reticulate-rugose, the border winged and toothed.

First found on Tweedside by I. M. H. in 1908. See *Tr. Bot. Soc. Edin.* 40, 1909. Det. A. Thellung. Exhibited at the Botanical Society of Edinburgh April 8, 1909. Found repeatedly in successive years along the banks of the Gala below Galashiels, Selk. Flowering August to September.

M. sylvestris L. and *M. rotundifolia* L. both occur, and have probably been brought in wool from various sources.

III (2) MODIOLA Moench Meth. 619, 1794.

A small genus of 5 species [1 D. T.] from South America and South Africa, differentiated by the three free bracteoles and transversely septate carpels.

460 (6) *M. caroliniana* (L.) G. Don Gen. } *Bristly fruited Mallow.*
Syst. i. 466, 1831. } *Mallow Weed* (Austral.).

M. multifida Moench Meth., l.c. *Malva caroliniana* L. Britton & Brown Fl. N. U.S. ii. 423, f. 2432.

Low grounds, Virginia to Florida, west to Texas (common on prairies), and in Central and South America, Mexico, Potosi (2000 to 2500 metres), Uruguay, Argentina, New Granada, Bogota to 2700 metres, Bermuda, Chile, Jamaica and S. Africa. Adventive and abundant in New Zealand.

An annual or biennial with diffuse, hirsute stems ; leaves long-petioled, cordate-ovate, more or less deeply 5-7 partite, the divisions lobed and toothed ; primary leaves orbicular, undivided ; peduncles longer than petioles ; flowers small, axillary ; petals obovate or oval-obovate, 6-10 mm. long, reddish, as long as calyx ; carpels in a depressed head, 2-valved, 2-seeded, separating when ripe from each other and from the central axis, each valve tipped with a slender spine.

First record for Britain : *M. multifida*, Galashiels, Selk., I. M. H. in *Rep. B.E.C.* 156, (1912) 1913.

Godron found it at Port Juvenal, France, in 1853.

21 GERANIACEAE J. St. Hilaire.

An interesting family of nearly 1000 species and 25 genera [Dur.] having representatives in every quarter of the world. The genus *Geranium*, of about 110 species [Dur.; 160 D. T.] is well represented in Britain in the showy blossomed *pratense* and *sylvaticum*. Several of its members, such as *dissectum* and *molle*, are very widely spread in cultivated or pasture ground, and a few of these probably came to Tweedside in wool, but these indigenous species are not enumerated here. The very showy Pelargoniums of our horticulturists, differing from the true *Geraniums* in their irregular flowers, are natives of the Cape, where *Monsonia* also has its headquarters.

ii8 ERODIUM L'Héritier Geran. t. 1-6, 1787.

A small genus of about 100 [160 Dur.] mainly herbaceous, rarely suffruticose species from the Mediterranean area, or weeds of roadsides or barren pastures, spread over the world. A few only are large-flowered species. It differs from *Geranium* mainly in the leaf nerves being pinnate, not palmate ; in the stamens being never more than 5, while the other five are rudimentary ; and in the carpellary awns being bearded and spirally twisted after they are detached from the axis. This latter characteristic accounts for the wide dispersal of the plants of this genus, because if the carpels are pressed into the fleece by the weight of the sheep lying down to rest the wool is penetrated by the sharp awn, which then spirally twists itself, penetrating even in some instances the skin. The resemblance of the fruit to a heron's beak suggested the name *Erodium*.

490 (2) E. Botrys Bertoloni.

Stork's Bill.

E. Botrys Bertol. Amoen. Ital. 35, 1819. DC. Prod. i. 647, 1824. Boissier Fl. Orient. i. 892, 1867. Nym. Consp. i. 139, 1878-80. Knuth Geran. in Engl. Pflanzenr. 256, 1912. Battand. & Trab. Fl. de l'Algér. i. 123, 1888. A. Gray Syn. Fl. N. Amer. i. pt. i. 362, 1897. Gay Hist. Chile Bot. i. 390, 1845. *Geranium Botrys* Cavan. Diss. i. 218, t. 90, f. 2, 1787. *Geranium supinum Botrys*, folio acu sursum spectante, Boccone Mus. 145, 1697. Fig. 10.



Fig. 10.

ERODIUM BOTRYS Bertoloni.

Native in grassy and sandy places, usually near the sea, in Portugal, Spain, France, Corsica, Italy, Sardinia, Sicily, Greece, Ionian Islands, Thrace, Rumelia, Tunis, Algeria, Morocco, Canaries and Madeira. Adventive in W. France (Dinan, etc.), N. and S. America, and in all settled districts of Australia.

This pretty glandular-pubescent species is characterised by the usually erect stem, often hispid below, with reflexed, bristly hairs; by the lower leaves being dentate or sinuate-pinnatifid, the upper pinnatifid or sub-pinnatifid, with numerous divisions; by the large purple-lilac petals, and especially by the very long fruit beak (8-10 cm.), the corkscrew-like awn of which has six or seven turns, whereby it readily penetrates the fleece.

First record for Britain: 1909, I. M. H., in *Rep. B.E.C.* 414, 1909. Found on mill waste heaps at Galashiels and Selkirk, 1912-1917, also on the banks of the Gala and the Tweed. It grows profusely and robustly under the favourable conditions of mill waste. A species closely allied to this was observed on mill waste heaps at Galashiels and Selkirk by I. M. H. in October 1916. Flowers and fruits July till November. Exhibited at the Linnean Society December, 1910. Melrose, Roxb., J. Fraser in *Ann. Scot. Nat. Hist.* 100, 1911.

It is quite possible that the Tweedside specimens (as in the case of other species) are not of direct Mediterranean origin, but are the Argentine descendants of European plants.

491 *E. malacoides* (L.) Willd. Phyt. i. 10, 1794.

Geranium malacoides L. Reichb. Ic. v. f. 4868.

In dry pastures, sandy places, by roads, &c., in the Mediterranean region—Portugal, Spain, S. France, Italy, Dalmatia, Greece, Turkey, extending into Asia Minor, Armenia, Palestine, Syria, Punjab and Indus Valley, Egypt, Tunis, Algeria, Morocco, Madeira, Canaries, and adventive in Chile, Peru, New Zealand, South Africa.

Annual, 3-5 dm., diffuse or erect, clothed with short spreading hairs; inflorescence glandular; leaves faintly lobed, ovate-oblong, with appressed pubescence, lower leaves cordate; sepals mucronate; petals rose-lilac, not much longer than sepals, the filaments glabrous; beak of carpel 3-4 cm. long, with 4-5 turns; carpel about 1 cm. long.

Var. *RIBIFOLIUM* (Jacq. Ic. Pl. Rar. iii. 1786-93 as a species) Brumh. Mon. 45, 1905. Var. *subtrilobum* (Jord. Pug. Pl. Nov. 42, 1852 as a species) Lange Pug. iv. 329, 1865.

Differs from the type in the smaller radical leaves, which are more definitely trilobed, the median lobe itself trilobed, sinus open and obtuse or rounded; petals smaller, and the beak short, 20-24 mm.

First found at Galashiels, Selk., by I. M. H., in 1913. Touchy found it at Port Juvenal, France, in 1827. The variety, new to Britain, Tweedside, Selk., I. M. H. in *Rep. B.E.C.* 315, (1913)

1914. Found on shingle near the junction of the Gala and the Tweed. Flowering July to September.

Dr Thellung, who named it, adds—"Differt a typo varietatis floribus et fructibus multo majoribus."

493 (2) E. Chium (L.) Willd. Sp. Pl. iii. 634, 1800.

In sunny, grassy, cultivated or waste places in the Mediterranean region—Portugal, Spain, S. France, Italy, Greece, Chios, Egypt, N. Africa.

A diffuse plant, resembling *E. malacoides*, but differing in the relatively broader, glabrous, orbiculate leaves, the lower ones lobate, cordate, the upper trilobed; peduncles many-flowered; filaments ciliate; beak 32-34 mm., five to six times as long as the eglandular carpel, which has 6-7 turns. The lower part of the plant is eglandulose, papillose.

First record: I. M. H. in *Rep. B.E.C.* 315, (1913) 1914. On waste heap at mill in Galashiels, Selk. Det. A. Thellung.

494 E. moschatum (L'Hérit. Geran. 6, n. 13) } *Musky Stork's Bill.*
Aiton Hort. Kew. 414, 1789.

G. moschatum L. Syme E. B. ii. t. 308. Reichb. Ic. v. f. 4867.

In grassy places, fields, waysides, in sandy or clayey soils throughout Europe except Scandinavia and N. Russia. In Syria, Persia, Palestine, Abyssinia, Egypt, Tunis, Algeria, Morocco, Canaries. Adventive in N. America in Ontario, Maine and California, where it is sometimes used as a fodder called Musky Fillerei, and in S. America in Chile. Abundant in New Zealand. S. Africa, common and sometimes cut for fodder. Australia—Victoria, S. and W. Australia. It is possibly native in the south-west of England, Ireland and Channel Isles.

A somewhat coarse-looking annual, 2-4 dm., sparingly glandular, viscid, with leaves pinnately cut into 10-13 large, ovate, doubly serrate divisions; sepals strongly mucronate; petals pinkish-purple or rose-lilac, obovate, as long as the calyx; carpel 4-5 mm., the beak with about 8 turns, 3-4 cm. long.

First record: In a field among rubbish not far below Galashiels, Selk., J. Stuart in *Proc. Berw.* 77, 1889. Abundant and in successive years on mill waste heaps at Selkirk and Galashiels, Selk. Also on the banks of the Gala and the Tweed a few miles further on in Roxb. See I. M. H. in *Tr. Bot. Soc. Edin.* 40, 1909. Flowering July to September.

495 E. romanum L'Hérit. ex Aiton Hort. Kew. ii. 414, 1789.

Geranium romanum Burm. f. Sibth. & Sm. Fl. Graeca t. 654.

In calcareous hilly places, by roads, etc., in the Mediterranean region—Portugal, Spain, S. France, Corsica, Italy, Greece, Turkey, Armenia, Syria, Algeria.

A more or less lax perennial, with stout woody rootstock; leaves large, elongated, the segments oval or lanceolate, incised or sub-pinnatifid; petals rose-coloured, large, twice as long as sepals, roundish-oval, contiguous; beak 4 cm., with 7-8 turns of the spiral.

First found in 1910 by I. M. H. on mill waste heaps in Galashiels, Selk. Also near the junction of the Gala and the Tweed. Noticeable for its strong growth. Flowering July to September.

497 *E. cicutarium* L'Hérit. ex Aiton Hort. Kew. ii. 414, 1789.

Syme E. B. ii. t. 307.

In fields, dry grassy places, waysides, etc., throughout Europe except Lapland and N. Russia; Persia, Arabia, Afghanistan, Beluchistan, N. Africa, Canaries, America, New South Wales, Victoria, S. and W. Australia, Tasmania. At La Paz, Bolivia, it grows in turf from 3000 to 4000 m. Naturalised elsewhere in all the temperate regions of the world. Adventive and abundant in New Zealand. A native of Britain, but its frequent occurrence on the river shingle at Galashiels and on the refuse heaps from wool-cleaning shows that it is to the wool industry its presence there is due.

A very variable species, annual or biennial, sometimes with a dense rosette of leaves closely adpressed to the soil, at other times a loose, straggling plant up to 3 dm.; leaves all pinnately cut, the segments themselves usually pinnatifid; peduncle erect, bearing an umbel of 2-12 small pink or purple flowers; sepals pointed, about the length of the obovate entire petals; the beak 20-45 mm. long, with 4-14 turns, but only 4-5 times as long as the hairy carpel.

First noticed by I. M. H. on both the Selkirk and Roxburgh banks of the Tweed as far as Dryburgh in 1908 and by the Leader at Earlston, Berwick.

Var. *PIMPINELLIFOLIUM* (Sibth. Fl. Ox. 211, 1794).

This plant occurs with the type, but it is of much more restricted distribution. It is usually larger and more diffuse, the petals having in most cases a dark spot at their base.

First found on Tweedside at Galashiels, Selk., by I. M. H., and extending along the Tweed into Roxb.

499 *E. cygnorum* Nees in Lehm. Pl. Preiss. i. 162. Fig. 11.

Australia—in grassy places on the Peak Downs and Maranoa River, Queensland; Mount Lyndhurst, Mount Koch, from Kangaroo Island and Spencer's Gulf to Lake Torrens, and further north, South Australia—one of the most valuable fodder plants in the district; not rare, Victoria; Nepean, Lachlan and Darling Rivers and on the Murrumbidgee, New South Wales; Swan River, thence to the Murchison River, W. Australia.



Fig. 11.

ERODIUM CYGNORUM Nees.

An annual or biennial, 7-25 cm., slightly pubescent or sometimes very hispid, with the stem-hairs spreading or reflexed; leaves deeply 3-lobed or divided to the base into 3 obovate or cuneate segments, which are themselves also more or less deeply toothed or three-lobed; flowers blue, usually 2-5 to the umbel; sepals pointed; petals obovate, about as long as sepals; carpel lobes glabrous, hairy or hispid, the beak about 5-7 cm. long, strong.

First record: On heaps of rubbish below Galashiels, A. Brotherston in *Proc. Berw.*, 136, 1873. Found by I. M. H. during seven consecutive years in precincts of Skin-works and woollen mills, Galashiels, Selk., thence along the banks of the Gala and the Tweed for ten miles, and on shingle at Melrose Suspension Bridge, Roxb., in 1911. Flowering June to September. Exhibited at the Linnean Society April 2, 1914. Det. A. Thellung.

Brotherston (*l.c.*) thought this was Stuart's *E. moschatum*, which he was unable to find.

118 (2) **MONSONIA** L. Mant. i. 14, 1767.

A small genus of about 17 [12 D. T.] species, mainly S. African, two extending into Asia. Annuals or perennials, herbaceous or suffrutescent, with slender stems and alternate leaves; peduncles bracteate above the middle; petals longer than sepals; stamens 15 in five sets of three, with filaments coherent for half their length. The name was given in honour of Lady Ann Monson.

499 (20) **M. brevirostrata** R. Knuth in *Engl. Jahrb.* xl. 67, 1907. Africa—Griqualand.

Annual, suffruticose, 1-2 dm.; leaf lamina pilose on the veins beneath, but often glabrescent, the base cuneate, the apex obtuse, the margin serrate, erose, about 17 mm. long by 6 mm. broad; flower stalks two-flowered, rarely one; sepals linear-lanceolate, with membranous margin, pubescent; petals entire, cuneate-obovate, about as long as calyx, bluish; fruit when ripe 3 cm. long, the valves hirsute-pubescent, with a very short beak, puberulous.

First British record: I. M. H., 1914. See *Rep. B.E.C.* 192, (1915) 1916. Found on shingle at the confluence of the Gala and the Tweed, Selk. Flowering August to September. Det. A. Thellung.

30 **LEGUMINOSAE** Jussieu.

This is one of the largest families, second only indeed to the Compositae, consisting of nearly 10,000 [9603 Uphof, 7000 Dur.] species, divided into about 500 [519 D. T., 428 Dur.] genera. Next to the Graminaceae it affords the greatest number of plants used for food of man or provender for animals, while from it are obtained a larger number of drugs and substances used in the arts than any other. A large number of our showy garden or greenhouse species belong to this family, which is well represented in every quarter of the globe;

indeed, in Australia they outnumber the Compositae by nearly two to one, nearly 1200 species being found in that island-continent. It is represented not only by herbs and shrubs but by bushes and large trees. In the tropics the magnificent *Amherstia*, the dazzling Cassias, the graceful Saman, the stately Tamarind, the brilliant *Caesalpinia*, the quaint-leaved *Bauhinia* and brilliant *Poinciana* belong to the Leguminosae, as does the graceful *Wistaria* of Japan, the magnificent Erythrinæ of Africa and America, and the showy and scented Wattles of Australia. While most plants of the family are wholesome, others contain active poisons, such as the ordeal poison, the Calabar Bean, *Physostigma venenosum*. Some are injurious to stock, as the Australian *Suainsonia*, which deranges the nervous system; others are deadly fish poisons, and a poisonous principle is also present in Laburnum seeds and in the bark of *Robinia Pseudacacia*. Astringent principles are largely developed not only in *Acacia Catechu*, the Cutch of tanners, but in other species of that and the allied genus *Mimosa*. Kino is another substance found in *Pterocarpus Marsupium* = *Mallotus philippinensis*. Logwood comes from *Haematoxylon campechianum*, and Indigo from *Indigofera tinctoria*, a dye of great durability and beauty. Our food is enriched with Peas, Beans, Haricots, and species of *Phaseolus*, the Scarlet Runner. The Locust bean, *Ceratonia Siliqua*, and Lentils, *Lens lenticula*, are also important food products, and in Alfalfa, *Medicago sativa*, we have perhaps the most useful fodder plant in the world. *Glycine Soja*, the Soya bean, is also of enormous and increasing value, while Vetches, Clover, Sainfoin, Nonsuch and Lupine are also of incalculable use to the agriculturist. This value is also greatly increased by their root-fibres affording a home for bacteria which fix the nitrogen from the air, and thus enrich the soil. Other species are planted under coco-nuts to prevent undue evaporation from the earth. To this order also the horticulturist is indebted for some of his most showy species, the very number of which prevents their being individually mentioned here.

139 MEDICAGO (Tourn) L.

A genus of about 50 [D.T.] species, with its centre of distribution in south Europe and west and central Asia. From the prickly fruit and their inhabiting grassy places the species have been carried chiefly by animals over a great portion of the globe. The diadelphous stamens and the fruit often prickly and spirally curled characterise the species, but the discrimination of the annual species is by no means easy, as both flowers and fruits should be present on the specimens. The name originates from *Medike*, the Greek name for lucerne or sainfoin or for some clover introduced from Media.

562 *M. Falcata* L.

Yellow Medic.

Syme E. B. iii. t. 336. Reichb. Ic. xxii. t. 62.

In dry, sandy, or stony places throughout Europe except Norway, Finland, Scotland, Ireland, N. Russia. In Siberia, Soongaria, Dahuria, China.

Rootstock woody ; stem 2-7 dm., diffusely branched ; leaves elliptic or linear, denticulate at apex ; flowers in a short corymbose raceme, deep bright yellow, standard streaked with darker lines ; fruit twisted on its axis but not coiled, 12-20 mm., nearly straight or falcate, never forming more than half the circle.

First record : Galashiels, side of Gala near its mouth, Selk., A. Brotherton in *Rep. Bot. Rec. Club*, 1874 and *Proc. Berw.* 136, 1873.

571 *M. tribuloides* Desr. in Lam. Enc. iii. 635, livr. 48, 1791.

M. truncatula Gaertn., var. *longeaculeata* Urban. *M. truncatula* Gaertn., var. *tribuloides* Burnat. *M. uncinata* Fl. Surrey 315.

In fields and dry places throughout the Mediterranean region—Dalmatia, Herzegovina, Greece, Turkey, Caucasus, Cilicia, Arabia Petrea, Egypt, Algeria, Tunis, Morocco ; Canaries, Madeira.

An annual, erect, pubescent plant, 2-4 dm. ; flowers orange ; fruits cylindric, flat, not reticulate, with 4-6 coils, the keeled margin grooved on both sides and armed with conical spines ; flower stalk (1-2 flowers) usually shorter than the leaf.

First found on Tweedside in 1909 by I. M. H. and G. C. D. on banks of the Gala about two miles below Galashiels, Roxb. Flowering August to September.

573 *M. litoralis* Rhode in Loisel. Not. 118, 1810.

Mediterranean region—Corsica, Portugal, Malta, Albania, Zante, Greece, Crete, Asia Minor, Syria, Daghestan, Egypt, Tunis ; Canaries, Madeira.

Annual ; stem 1-4 dm., prostrate, angular, with adpressed villous hairs ; leaflets obcordate or obovate, denticulate towards apex ; stipules laciniate-pectinate ; peduncles 2-4 flowered, longer than leaves ; petals orange ; pod cylindric, in 3-5 approximate coils, 6 mm. long, truncate at base and tip, margin thick, with a prominent nerve and two rows of rather distant, subulate, uncinat prickles ; seed oblong-reniform.

First found on the banks of the Gala within the burgh of Galashiels, Selk., I. M. H., 1914.

578 (2) *M. praecox* DC. Cat. Hort. Monsp. 123.

Reichb. Ic. xxii. t. 68, f. 1-2. Fig. 12.

Uncultivated ground, sea sands and stony places in the Mediterranean region of Spain, France, Italy, Dalmatia, the Balearic Isles, Corsica, Sardinia, and Taurus.

Allied to *M. hispida*, but smaller and less pubescent, with thinner stems, very small, obovate, obcordate, cuneate leaflets and pinatifid-laciniate stipules ; fruit smaller, with 2-3 coils, and the flower stalk has usually only 1-2 flowers.



Fig. 12.

MEDICAGO PRAECOX DC.

First found in Britain in 1909 by I. M. H. and G. C. D. Exhibited at the Linnean Society December 1, 1910. See *Rep. B.E.C.* 499, (1910) 1911. On banks of the Gala near its junction with the Tweed, Selk. Flowering August to September.

579 *M. hispida* Gaertn. Fr. ii. 349, 1791, emend. } *Toothed Medic.*
Urban Mon. 74. }

First record: Sparsely on shingle by sides of the Tweed, Galashiels, Selk., I. M. H., 1913.

Var. *DENTICULATA* (Willd. Sp. Pl. iii. 1415, as a species), Syme E. B. iii. t. 338. Reichb. Ic. xxii. t. 70.

In uncultivated and sandy places, in pastures and grassy spots, among crops, etc., commonly and widely distributed in central and southern Europe, south of England, Ireland (often adventive), Portugal, Spain, France, Belgium, Germany, Italy, Dalmatia, Serbia, Taurus, Siberia, Persia, Punjab, Scinde, etc., China, Japan, Afghanistan, Beluchistan, Abyssinia, Egypt, Algeria, Morocco, Canaries, Madeira, Azores, Natal, but often adventive, as it is in North America—Nova Scotia to Pennsylvania, the Southern States and California. Also in Argentina and Chile, and found on the race-course at La Paz, Bolivia, at nearly 4000 m. Abundant throughout New Zealand and Australia.

A strong, herbaceous, usually glabrous annual, 2-5 dm. high; leaflets cuneate, obovate to obcordate, mucronate, not blotched; flower stalks of 3-8 small flowers, nearly as long as the leaf; fruit glabrous in 2-6 coils, loose, strongly reticulate, margin obtuse, deeply grooved on each side, with two rows of long, thin, divergent, hooked prickles.

One of the very frequent wool aliens carried by merino sheep into both hemispheres. The fruits with hooked spines are of very common occurrence in wool. It is one of the plants which, as Warming & Vahl (*Oecology of Plants*) say, have nearly extirpated the original flora of the Pampas, which occupy the vast rockless alluvial South American plains that stretch from the Atlantic coast to the Andes and from Patagonia to the forests of Paraguay and Brazil. The boundless, level or somewhat undulating, uniform, treeless surface is clothed with perennial grasses and herbs—"a shoreless sea of grasses on which the eye finds no resting point save where the sun rises and sinks." Here European species of Composites and Grasses, with *Medicago denticulata* and Fennel, occupy miles of country. Indeed, Otto Kuntze says that three-fourths of the flora of Buenos Aires has been introduced chiefly from the Mediterranean region. In this area the Medic becomes very luxuriant, and, as has been said, fruits are very frequent in Argentina wool. It is not a little curious that this native of the Old World, doubtless taken out with merino sheep from Spain, should again return to Europe and grow abundantly and luxuriantly on the shores of the inclement Tweed,

First record as an aggregate plant: *Medicago* with hooked spines, a small and peculiar variety, Stuart, 1868, in *Proc. Berw.* 73, 1869-72. Professor Balfour and G. Bentham agree it is only *M. denticulata*. Kelso, A. Brotherston in *Rep. Bot. Rec. Club*, 1874. A plant of *denticulata* approaching *lappaceum* was found at Galashiels by I. M. H. in 1916. The var. *denticulata* is abundant in the vicinity of woollen mills at Galashiels and Selkirk, on the lower reaches of the Gala, Selk., thence on shingle along the Tweed for nine or ten miles, Roxb. As a rule these plants were large and robust and heavy with fruit. Flowering June to October.

Var. *APICULATA* Burnat Fl. Alpes Marit. ii. 106. *M. apiculata* Willd. Sp. Pl. iii. 1414.

With a somewhat more restricted distribution than the type, from which it chiefly differs in the longer and straighter spines on the fruit.

Found on shingle by the Gala about a mile below Galashiels, Selk., in July 1909 by I. M. H. and G. C. D., this being the first record for the county. Flowering June to September.

Var. *CONFINIS* Burnat, l.c. *M. apiculata*, var. *confinis* Koch Syn. 164, 1837.

With a still more circumscribed distribution, it varies in the opposite manner from *apiculata*, since the fruit spines are reduced to obtuse tubercles.

Galashiels, Selk.

Var. *PENTACYCLA* (DC. Cat. Hort. Monsp. 124, as a species) Druce Brit. Pl. List.

This differs from the type in having larger fruits, 6-10 mm. against 4-6 mm., and there are 4-6 coils of the helix against 2-3½.

This was first recorded by A. Brotherston from Tweedside, Kelso, Roxb. See *Rep. Bot. Rec. Club*, 1874. See also *Proc. Berw.* 136, 1873.

580 *M. arabica* Huds. Fl. Ang. 288, 1762. *Heart Clover.*

M. polymorpha, var. *arabica* L. *M. maculata* Sibth. Syme E. B. iii. t. 339. Reichb. Ic. xxii. t. 67.

In grassy and uncultivated places and among crops in S. England, Holland, Belgium, France, Spain, Portugal, Italy, Hungary, Dalmatia, Greece, Turkey, Taurus, S. Russia, Caucasus, Persia, Tunis, Egypt, Algeria, Morocco, Canaries. Adventive in N. America from New Brunswick to Pennsylvania and also on the Pacific coast of S. America in Chile and in North Island, New Zealand.

This differs from *M. hispida*, var. *denticulata*, mainly in the fruit being ovate subglobular and in the leaflets usually having a brownish-black or purplish-black irregular blotch. The plant is

of a brighter green and has often long articulated hairs on its vegetative parts.

First record : *M. maculata*, Melrose Cauld, Roxb., Stuart in *Proc. Berw.* 74, 1869. Tweedside, A. Brotherston, *l.c.*, 438, 1872. Found by I. M. H. abundantly at Galashiels Skin-works and on the banks of the Gala, Selk., and along the Tweed at various places for a distance of nine miles, Roxb. Upon woollen waste heaps this plant develops strong growth, and has large leaves not invariably trifoliate, as four and even five leaflets are occasionally met with. Flowering July to September.

581 *M. minima* (L.) Bartal. Cat. Piante Sien. 61, 1776.

Syme E. B. iii. t. 340.

In dry places and grassy hills throughout Europe, except Scotland, Ireland, N. Scandinavia, N. Russia ; in the Taurus, Caucasus, Mesopotamia, Persia, Afghanistan, Kashmir, Abyssinia, Egypt, N. Africa, Canaries.

A small annual or biennial, 5-30 cm., greyish pubescent with short hairs ; stipules entire or slightly dentate ; flower stalks two-flowered ; flowers small ; fruit puberulent, nearly globular, 5-8 mm. broad, 3-5 coils, with two rows of densely crowded awl-shaped, hooked, erect, two-limbed spines. which exceed the breadth of the fruit in length.

First record : Tweedside, Kelso, Roxb., A. Brotherston in *Proc. Berw.* 1872. Found in abundance in same localities as *M. arabica*. Like various other aliens, *M. minima* is found growing vigorously in gardens in Galashiels, doubtless owing to the fact that woollen mill waste is largely used as a fertiliser. This explains both the presence of the seeds and the strong development of the plants. Flowering July to September.

Var. *VISCIDA* Koch Syn. ii. 180, 1846.

A more or less glandular-pubescent form, Galashiels, Selk., 1917, I. M. H. and G. C. D. See *Rep. B.E.C.* 19, (1917) 1918.

Var. *ELONGATA* Rochel Enum. Banat. 15.

A large pubescent plant, nearly 1 metre across, Galafoot, Selk., 1917, I. M. H. and G. C. D.

Var. *RECTA* (Willd. Sp. Pl. iii. 1415, 1800, as a species) Burnat, *l.c.* *M. minima*, var. *longisetata* DC. Prod. ii. 178. *M. recta* Willd. Sp. Pl. iii. 1415. *M. minima*, var. *mollissima* (Roth Cat. iii. 74, 1806, as a species) Sprengel.

This differs from the type in being clothed with a whiter and softer eglandular pubescence and in having longer spined fruits.

First British record : I. M. H. and G. C. D., Galashiels, Selk., in *Rep. B.E.C.* ii. 499, (1910) 1911. It comes up in garden soil at Galashiels which has been dressed with mill waste, and is of frequent occurrence in the area in both Selk. and Roxb.

582 *M. laciniata* Mill. Gard. Dict. n. 5, 1768. Fig. 13.

In waste places, sandy deserts, etc., Canaries, N. Africa, Egypt (Boissier, but Muschler gives *M. Aschersoniana* only), Palestine, Syria, Arabia, Persia, Beluchistan. Adventive in Spain, S. France (Montpellier, since 1670), Provence, Alpes Maritimes, Corsica, Dalmatia, Cape, Natal.

A glabrous, prostrate annual; stems filiform; leaflets cuneate, sharply indented on the edges, having three acute points at the apex; flowers small; fruits small, with many weak, straight, subulate, hooked spines, subglobose, the margin flat and thick; seeds oblong.

First found by J. Fraser and I. M. H. in 1908 on the shingle of the Gala, Selk.; also by I. M. H. on the banks of the Tweed and at the junction of the Ellwyn and the Tweed, and on mill waste heaps, Roxb. Also observed from 1909 to 1917. See *Tr. Bot. Soc. Edin.* 40, 1909, and *Ann. Scot. Nat. Hist.* 41, 1909. Flowering August to October. Named at Kew.

Var. *BRACHACANTHA* Boissier Fl. Orient. ii. 104. *M. Aschersoniana* Urban Mon. 77, 1873.

Specimens probably referable to this Egyptian plant were gathered in 1913.

140 MELILOTUS (Tourn.) Miller Gard. Dict. Abr. ed. 4, 1754.

A small genus [20 D.T.] having its head centre in the Mediterranean region. The plants frequently contain coumarin, giving the fragrance of new-mown hay. They are usually annual or biennial, and are distinguished by their short fruit, not coiled in a helix, and by their long racemes of white or yellow flowers and pinnately trifoliate leaves with toothed leaflets. One or two species are used to give a certain flavour to cheese. From their occupying ground frequented by sheep and cattle the fruits become entangled in the wool, although they are also brought into our area with foreign corn and seeds. The name comes from *mel*—honey, and *lotus*.

592 *M. sulcata* Desf. Fl. Atl. ii. 193, 1798.

Flora Graeca t. 742. Reichb. Ic. xxii. t. 74.

In stony places, by streams and on roadsides in Spain, S. France, Italy, Dalmatia, Greece; in damp places in Syria and Palestine; N. Africa—oasis in Libyan Desert; Canaries.

An annual, 2-4 dm., with small yellow flowers (3 mm.); raceme lengthening and becoming lax; fruits pendulous, obovate-orbicular, acutely keeled; fruit coat concentrically plicate-rugose, the wrinkles closely contiguous; stipules ciliate, dentate; pedicels shorter than the calyx-tube.

First record: *M. sulcata*, a wool alien, Tweedside, Kelso, Roxb., A. Brotherston in *Rep. Bot. Rec. Club* 23, 1878.

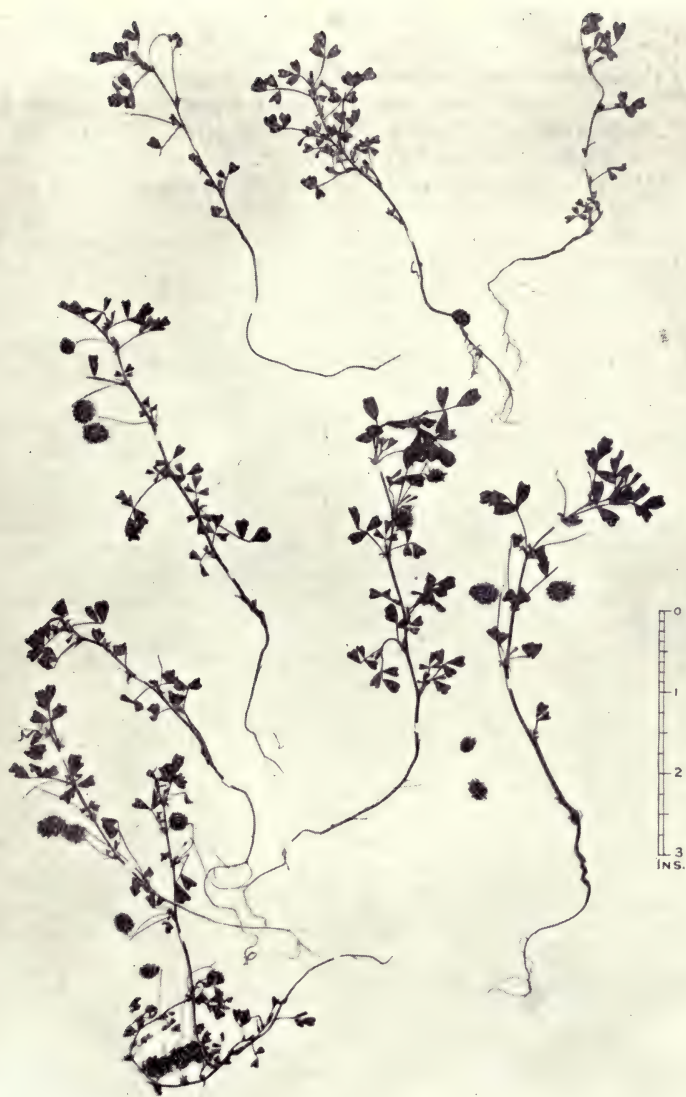


Fig. 13.

MEDICAGO LACINIATA Mill,

- 593 *M. officinalis*** Lam. Fl. Fr. ii. 594, 1778. *Melilot.*
M. altissima Thuill. Fl. Paris, ed. 2, 378, 1799. *Trifolium M. officinalis* L., var. Syme E. B. iii. t. 341.

On the borders of streams and lakes, in wet fields, damp rocky places, in woodlands and waste ground throughout Europe except Scandinavia, N. Russia, S. Italy and Greece; in the Orient, in Ladak and Mitra at 3000-4000 metres altitude, Beluchistan and China. Adventive through the United States, Canada and New Zealand.

A biennial with glabrous foliage and obovate, shortly acuminate fruits, covered with closely appressed hairs.

First evidence: A specimen in *Herb. Druce* from fields near Sprouston, Roxb., July 18, 1809. Recorded for Roxburgh by A. Brotherston in *Rep. Bot. Rec. Club* 101. 1875, and frequent on Tweed-side, *Proc. Berw.* 251, 1875. Still common, I. M. H.

- 595 *M. alba*** Desrousseaux in Lam. Enc. Meth. iv. } *White Melilot.*
 63, 1797.

M. leucantha Koch. *M. vulgaris* Willd. Syme E. B. iii. t. 342.

In hedges, coppices, fields, sandy places and waste ground throughout Europe except N. Sweden, N. Russia, Greece and S. Italy; in Siberia, Caucasus, Anatolia, Persia, Turkestan, Bengal, ascending to 4000 metres in Mitra, China. Adventive throughout the United States, Canada and New Zealand.

A tall, slender biennial, with long, lax racemes of small white flowers and a glabrous, reticulate, obovate, apiculate fruit.

First record: As *M. vulgaris*, Roxb., A. Brotherston in *Rep. Bot. Rec. Club*, 1875, and as *M. leucantha*, on the roadside between Ednam and Kelso, in *Proc. Berw.* 251, 1875. About Berwick Castle, Northumb., 1842, Johnston, *N.H.* 286, 1853. Found rarely near the mouth of the Gala, Selk., by I. M. H., November 1907. Flowering August to November. See Johnston (*Fl.* 286, 1831) under *Trifolium leucanthum*, where the habitats given (162, 1829) are said to belong to this species—i.e., sea-banks in several places, etc.

- 596 *M. arvensis*** Wallr. Sched. Crit. 391, 1822.

M. officinalis Desr., not of Lamarck. *M. Petitpierreana* Hayne. *M. Melilotus officinalis* A. & G. Syme E. B. iv. t. 343.

In wild, sandy places, cultivated ground, fields and waysides throughout Europe except Norway, N. Russia, S. Italy, Greece; in Siberia, Armenia, Transcaucasia, Persia, China. Adventive in New Zealand.

Usually a shorter biennial than the two preceding species, with the ripe glabrous fruit olive-green, not black; flowers normally yellow, rarely white (*Petitpierreana*).

First record: Cultivated ground, Tweedside, Kelso, Roxb., A. Brotherston in *Proc. Berw.* 269, 1874, and in *Rep. Bot. Rec. Club* 23, 1879. Found in 1907 on a grassy bank of the Gala about a mile below Galashiels, Selk. Normally of strong growth, occasionally attaining a height of 12 dm. Flowering freely August to October.

597 **M. indica** All. Fl. Pedem. i. 308, 1785.

M. parviflora Desf. *Trifolium M. indica* L., var. *b.* Syme E. B. iii. t. 344. Reichb. Ic. xxii. t. 76.

In damp sandy places, fields, cultivated ground, etc., in Portugal, Spain, S. and W. France, Italy, Dalmatia, Herzegovina, central Russia, Greece, Turkey, Taurus. Adventive in other countries and doubtless in many places in these. In Caucasus, Asia Minor, Mesopotamia, Persia, Afghanistan, Beluchistan, India—north-west Province of Bengal, N. China, Egypt, Arabia, Tunis, Algeria, Morocco, Canaries, Madeira. Adventive in N. America on ballast on the east coast. An abundant weed in the Far West, often as a very tall form; in S. America—Chile, etc., and in Australia.

The very small flowers, dark stem, and small, globose, glabrous, reticulate fruits offer differentiating characters.

First record: I. M. H. in *Tr. Bot. Soc. Edin.* 40, 1909. A common plant in the vicinity of woollen mills at Galashiels, Selk.; also occurring by the Tweed, Roxb. Flowering July to September. Fruiting freely.

141 **TRIFOLIUM** (Tourn.) L.

A large, widely spread and very valuable genus [300 species D.T.] occurring in the northern hemisphere, absent or rare in the tropical regions, but again represented in South Africa and South America. It may readily be separated from *Trigonella* or *Medicago* by the fruit and from *Melilotus* by the compact head of flowers. The name alludes to the three divisions of the leaf. A large number of the species afford valuable forage. They are, however, but feebly represented among wool aliens, partly perhaps from the absence of hooked spines on the fruits or from their being free from viscidities, and perhaps in part also from the fruit which is enclosed in the calyx having no special protective coat, so that possibly the greater number are destroyed in the boiling water and other treatment to which the wool is subjected—processes which only seem to stimulate the germination of many species. Among grain or forage introductions the Trefoils are usually common.

602 **T. ochroleucon** Huds. Fl. Ang. 283, 1762. *Sulphur Clover*. Syme E. B. iii. t. 349.

In grassy places in east England, France, Belgium, Germany, Spain, Portugal, Italy, Switzerland, Austria, Hungary, Montenegro,

Poland, Transylvania, Serbia, Greece, Thrace, S. Russia, Caucasus, Cilicia, Armenia, Taurus, Algeria. Adventive in New Zealand.

- A pubescent perennial, with sulphur-coloured, oblong flower-heads; calyx teeth broad at base, more strongly nerved than in *pratense*. A pink-flowered form occurs in Greece, etc.

First record: Mouth of Gala, Selk., A. Brotherston in *Proc. Berw.* 136, 1873.

606 *T. angustifolium* L.

Sibth. & Sm. *Fl. Graeca* t. 749. Reichb. *Ik.* xxii. t. 93.

On grassy hills and in sandy places in Portugal, Spain, France, Italy, Austria, Montenegro, Serbia, Bulgaria, Transylvania, Hungary, Greece, Turkey, Asia Minor, Syria, Persia, Caucasus, Egypt, Tunis, Algeria, Morocco, Azores, Canaries, Madeira. Adventive at the Cape.

A striking species from its long, spicate, pale-rose flower-head; calyx-tube 10-nerved; leaves alternate; stipules narrow.

First found on Tweedside in 1908 by J. Fraser and I. M. H. Exhibited at the Botanical Society of Edinburgh on 8th August 1909. See *Tr. Bot. Soc. Edin.* 40, 1909. Also by I. M. H. on the banks of the Gala, Selk., and of the Tweed as far as Melrose, Roxb. Plant of vigorous growth, carrying flower-heads 5 cm. in length. Flowering July to September. Det. A. Thellung.

620 *T. subterraneum* L.

Syme *E. B.* iii. t. 346.

In dry, sandy and gravelly places in England, Ireland, Holland, Belgium, France, Portugal, Spain, Italy, Dalmatia, Herzegovina, Greece, Thrace, Taurus, Asia Minor, Caucasus, Persia, Syria, Tunis, Algeria, Madeira, Canaries. Adventive in New Zealand.

A small prostrate annual, remarkable because the fruit is usually matured beneath the soil. At first the stems are arcuate-ascending, but as the flowering period ceases the flower stalk bends at the end so that its top is directed downwards, and eventually buries itself in the earth and becomes rooted beneath the surface. The flowers are white and very narrow.

First found by I. M. H. in 1914 in grounds of Galashiels Skin-works and on woollen waste heaps at mills, Selk., not elsewhere. Flowering July to August. Det. G. C. Druce.

622 *T. resupinatum* L.

Syme *E. B.* iii. t. 364. Reichb. *Ik.* xxii. t. 107, f. 2.

In grassy and sandy places and moist fields in Spain, Portugal, France, Italy, Dalmatia, Herzegovina, Serbia, Bulgaria, Transylvania, Greece, Turkey, Taurus, Beluchistan, Persia, Transcaucasia, Egypt, Tunis, Algeria, Morocco, Canaries, Madeira, Azores.

Largely cultivated for fodder in Afghanistan, Khagan. Adventive and fast spreading in New Zealand.

An annual with rose-pink flowers, differing from most clovers in the twisted corolla, so that the standard is the lowest petal; the fruit is short and globular; the calyx becomes inflated; and the flower stalks are longer than the leaves.

First found by I. M. H. in 1911 and repeatedly since, but only on shingle along the banks of the Gala and the Tweed, Roxb., near Galashiels. In flower August and September.

The *T. resupinatum* in *Tr. Bot. Soc. Edin.* 41, 1909, is *T. tomentosum*.

623 *T. tomentosum* L.

Reichb. Ic. xxii. t. 107, f. 1.

In rocky and sterile soils, not pasturage, and maritime sandy situations in Portugal, Spain, S. France, Italy, Dalmatia, Montenegro, Greece, Thrace, W. Asia, Persia, Syria, Palestine, Egypt, Tunis, Algeria, Morocco, Canaries. Quite naturalised in S. Africa.

A small, annual, glabrous plant, with flower stalks shorter than leaves, small pink corolla, and calyx which in fruit becomes densely tomentose.

First found by I. M. H. in 1909 and during consecutive years on the bed of the Gala near Skin-works, and along banks of the Gala, Selk., and of the Tweed below Galashiels, Roxb.; also especially plentiful on a bed of pebbles a mile above Melrose, Roxb. Det. G. C. Druce.

631 (2) *T. cernuum* Brot. Phyt. Lusit. i. 160, t. 62, 1804.

In grassy and sandy hilly places in Central and Western Spain and Portugal.

A glabrous, many-stemmed annual, the stems procumbent-ascending, slender, hollow, branched, 1.25-4 cm. [5-40 cm. Rouy]; lower leaves with long stalks; leaflets obovate or oblong cuneate, apex with a longish mucro, the margins sharply mucronate-denticulate, strongly nerved below; stipules whitish, membranous, lanceolate, longly acuminate; the peduncles axillary and pseudo-terminal, flexuous, slender, short; umbels subsessile; flowers pedicelled, equalling or exceeding the length of the calyx tube, reflexed; calyx segments in fruit linear-subulate; corolla in loose or laxish heads of 15-30 rose or pale purple flowers, the vexillum deeply emarginate, obcordate-oblong, strongly striate; style short, curved; pod compressed, narrowed at base, with 1-4 or more subreniform seeds.

First record for Britain: I. M. H., 1917, on pebbles at the junction of the Gala and the Tweed, Selk. In flower July 28, 1917. See *Rep. B.E.C.* 19, (1917) 1918. Det. A. Thellung.

632 T. glomeratum L.

Syme E. B. iii. t. 358.

In dry, sandy, gravelly and grassy places, on maritime sands, etc., in Ireland, S. and E. England, France, Spain, Portugal, Italy, Dalmatia, Herzegovina, Thasos, Turkey, Armenia, Caucasus, Asia Minor, Syria, Tunis, Algeria, Morocco, Madeira. Adventive in New Zealand.

A glabrous annual, prostrate, spreading in a circle, with short calyx teeth and small, numerous, globular, axillary flower-heads of pale bluish-purple corollas.

First found by J. Fraser and I. M. H. in 1908. See J. Fraser in *Ann. Scot. Nat. Hist.* 41, 1909. Frequent at Galashiels Skinworks and on shingle of the Tweed at its confluence with the Gala, Selk., in successive years. Flowering July to August.

152 CORONILLA (Tourn.) L.

An interesting but not very homogeneous genus of [about 20 species D.T.] annual and shrubby and bushy plants, widely distributed over the Mediterranean region. They are often very ornamental and are distinguished from *Cytisus* and *Genista* by the jointed fruit. The name is derived from *koronos*—a crown, in allusion to the inflorescence.

667 C. scorpioides (L.) Koch Syn. Fl. Germ. 188, 1837.

Ornithopus scorpioides L. *Astrolobium scorpioides* DC. Sibth. & Sm. Fl. Graeca t. 715.

In cultivated ground and among corn crops in Portugal, Spain, S. and Central France, Italy, Serbia, Montenegro, Herzegovina, Adriatic coast, Greece, Turkey, Taurus; in grassy places in Asia Minor, Caucasus, Persia, Syria, Palestine, Egypt, Tunis, Algeria and Morocco.

A glaucous, glabrous, many-stemmed annual; leaves trifoliate; leaflets fleshy, the terminal large, oval, and the lateral small, reniform, orbicular; petals small, yellow, scarcely longer than sepals; pods arcuate, pendulous, linear, 3-9 articulations.

First record: *Astrolobium scorpioides*, Tweedside, A. Brotherston in *Rep. Bot. Rec. Club.* 77, 1874, and *Proc. Berw.* 270, 1874.

158 VICIA (Tourn.) L.

A large genus of over 100 species, chiefly dispersed over the temperate regions of the Old World, especially in northern latitudes and in the Mediterranean and West Asian areas, also in South America. The species are of very varying habit and are mostly hardy annuals, biennials or perennials. The name is the Latin word for the genus used by Pliny. With the exception of *V. sativa*, which is very extensively used as a fodder plant, and *V. Faba*, the Bean, which is of high value as a food for horses, the plants are of little economic importance. *V. sylvatica* and *V. Orobus* are beautiful native species, and *V. varia*

and *V. villosa* are of common adventitious occurrence, especially about chicken runs, but the genus is almost unaccountably rare on Tweed-side. The flowers are often blue, bluish-violet, or yellowish-white, rarely dark purple in colour. The genus is distinguished from *Lathyrus*, of which it has the habit, by the more numerous leaflets and by the filiform style, which is hairy below or all round. In *Lathyrus* the leaflets are fewer, often only a pair, the petals are broader and the style flattened and hairy on the upper margin only.

705 (2) *V. pubescens* Link Handb. ii. 190, 1831.

Ervum pubescens DC. Fl. Fr. v. 582. *E. Biebersteinii* Guss.
E. Salisii Gay.

S. Europe in the Mediterranean area—Spain, France, Italy, Greece, Turkey, Crete, Lydia, Taurus, Caucasus ; N. Africa, Canaries.

Stems slender, climbing, angular, 3-6 dm., more or less puberulous ; tendrils simple or rarely compound ; lower leaflets ovate, upper elliptic-oblong, all mucronate ; lower stipules half hastate, upper linear, acute ; peduncles slender, 1-5 flowered, rather longer than leaves ; calyx teeth linear subulate, longer than tube ; corolla bluish-white ; pods oblong-linear, in the type pubescent, in the variety glabrate ; hilum ovate-rotund, one-tenth of the circumference. Closely resembles *V. tetrasperma*, but differs in the calyx teeth being longer than the tube ; in the broader leaflets ; in the narrower stipules ; in the hilum being much smaller (in *tetrasperma* one-fifth of the circumference) ; in the plant being pubescent, not glabrous, and in the peduncles being sometimes three-flowered.

The Tweedside plant is var. *leiocarpa* Tenore Fl. Nap. 4.

First British record : I. M. H., Galashiels, Selk., 1917. Flowering August 1917. See *Rep. B.E.C.* 20, (1917) 1918. Det. A. Thellung.

160 LATHYRUS (Tourn.) L.

A large genus of about 130 [D.T.] species, spread over the temperate regions of the globe, distinguished from *Vicia* by the tube of the stamens being truncate, not oblique, at the mouth, and from *Pisum* by the slightly twisted style. It contains many ornamental garden plants and others of important economic value. The name was used by Theophrastus for a plant of this family. It is very poorly represented among wool aliens on the Tweed.

715 *L. angulatus* L.

In fields, among corn crops and by waysides in Belgium, France, Spain, Portugal, Switzerland, Italy, S. Austria, Dalmatia, Corfu, Armenia (?), N. Africa, Canaries.

A narrow-leaved annual resembling *sphaericus*, but differing in having purplish not reddish flowers and in the slender flower stalk being 4-6 times as long as the leaf stalk and articulated at the top.

First record : Tweedside, Kelso, Roxb., A. Brotherston in *Proc. Berw.* 136, 1873. This and the other species may have been introduced with foreign corn.

722 *L. sativus* L.

Bitter Vetch.

Sibth. & Sm. *Fl. Graeca* t. 695.

In cultivated ground among crops in Portugal, Spain, Italy, Dalmatia, Herzegovina, Serbia, Greece, Turkey. Adventive in Belgium, France, Holland, Germany, &c., in W. Persia, &c., India, tropical Africa. Very largely cultivated in the Volga district of Russia and in Egypt, but the too free use of it by man or beast produces a special form of paralysis.

A somewhat succulent, slender, diffuse, glabrous annual, with reddish-purple or white flowers; stem narrowly winged upwards; flower stalk shorter than leaf; seeds large, white, angular.

First record : Tweedside, Kelso, Roxb., A. Brotherston in *Proc. Berw.* 136, 1873. It is probable that the origin of this plant is central Asia, but its ancient culture has introduced it into very distant countries as a fodder plant.

726 *L. Aphaca* L.

Syme E. B. iii. t. 397.

In hedges, wood borders and cultivated ground in central and S. Europe, from England and Denmark to S. Russia, in the Orient, Persia, Afghanistan, Kashmir, &c., Egypt, N. Africa.

A striking annual in its glaucous colour, its pale yellow flowers and especially in the absence of true leaves, the enlarged foliaceous stipules replacing them.

First record : Tweedside, Kelso, Roxb., A. Brotherston, 1872, in *Rep. Bot. Rec. Club*, 1878. First record for Selk., I. M. H., 1909, on banks of Tweed two miles below Galashiels; also in a garden in that town growing as a weed where wool waste had been used as a fertiliser. Flowering August to October.

31 ROSACEAE Jussieu, 1789.

A large and very variable family [over 3000 species Uphof; about 1500 D. T.], divided into about 100 [D. T.] genera, best represented in the temperate regions of the Northern Hemisphere, but occurring also in the tropics and the Southern Hemisphere. It contains such inconspicuous flowering species as *Alchemilla*, the magnificent roses, the ornamental Spiraeas, *Kerria*, *Geum*, &c. Others afford delicious fruits—Strawberries, Raspberries, Apricots, Peaches, Cherries, Plums, Quinces, Pears, Medlars, Apples, Almonds and Loquats. The leaves of *Prunus Lauro-cerasus* on distillation yield Hydrocyanic acid. *Prunus serotina*, and the vermifuge, Kousso—*Hagenia* or *Brayera anthelmintica*, are used in medicine, while species of *Quillaia* contain saponin.



Fig. 14.

ACAENA ANSERINIFOLIA (Forst.) Druce.

173 ACAENA [Mutis MSS. ined.] L. Mant. ii. 145, 1771.

A small genus of about 40 species named from *akaina*, a thorn, especially plentiful in South America, occurring also in California, Mexico and the Sandwich Islands. A few species occur in New Zealand and Australia. It is characterised by its small green or purplish flowers in a capitate or spicate inflorescence, its herbaceous habit, pinnate leaves, mature calyx armed with prickles, few stamens and pendulous ovule. Allied to *Poterium*.

916 A. anserinifolia (Forst.) Druce. { *Bidi-bidi, Piri-piri* (New Zealand), *Burrs*.

Ancistrum anserinifolia Forst. Char. Gen. 4, 1776. *A. Sanguisorbæ* Vahl. Fig. 14.

In pasture ground, etc., Australasia : New South Wales—Port Jackson, Blue Mountains, Head of Gwydir River, Hastings River, Ilawarra ; Victoria—Port Philip, etc., near the Murray River ; Tasmania—common throughout the colony ; South Australia—Kangaroo Island, Torrens River, etc. ; West Australia—King George Sound, thence to Swan River ; New Zealand—abundant throughout, Auckland and Campbell Island to 1000 metres ; Tristan d'Acunha, Kermadec, North and South Islands, Chat-ham Islands, Antipodes and Macquarie Islands.

A creeping perennial with rather pretty foliage, reminding one of the less hairy-leaved form of *Potentilla anserina*, often woody at the base ; branches leafy, ascending at tips, freely rooting at nodes ; leaves variable, 2.5-7.5 cm. long, with 3-6 pairs of oblong, obovate or sub-orbicular, deeply toothed or serrate leaflets, nearly glabrous above, silky-hairy beneath ; flower-stalks slender, 6-12 cm. long ; flower-heads globose, 1-2 cm. or more in fruit, crimson-red ; fruiting calyx 4-angled, with a long barbed bristle at each angle ; achenes broadest near the base, narrowed upwards.

First record : J. Roseburgh, as a firmly established colony on the banks of the Tweed below Leaderfoot, Roxb. See J. Fraser in *Ann. Scot. Nat. Hist.* 100, 1911. Found by I. M. H. on a rocky bank of the Tweed near Melrose, quite established, and also at intervals along the shores from Galashiels, Selk., to Dryburgh, Roxb. Flowering July to October. Exhibited by I. M. H. at the Linnean Society April 2, 1914. One plant was noticed with nearly 40 flower heads and runners a metre long. The plant has now become permanently established, and in some cases covers the ground for a hundred metres. Named at Kew.

This very widely distributed and common plant of Australia is a serious trouble to sheep farmers on account of the soft prickly fruits becoming entangled in the wool. They are difficult to remove and depreciate its value, not only as an impurity but because they stain the wool a reddish colour. Seeds have been found in wool from New South Wales and Queensland. Bidi-bidi is said to be the Maori name.

This species is allied to the South American *ovalifolia* of Ruiz & Pavon. It exists as a variety, var. *antarctica*, in the extreme south of Australia. Dr Cockayne (*The Sub-Antarctic Islands of New Zealand*, 1909) says that on Campbell Island, where it grows, there are some eight thousand sheep, and at least two-thirds of the island is open to them. On Disappointment Island, when the vegetation has been destroyed by Molly-hawks nesting there the first plant to appear is var. *antarctica*, which forms sheets over the ground and gives the distinguishing green colour. Although easily dominant and at a distance apparently the only plant, yet in time the ground will be occupied by tussocks of *Aeluropus littoralis*, which will as they grow destroy or thin out the *Acaena*. Hare-like, it will finally in many cases climb over the tussocks, gain the light and preserve itself from destruction. In New Zealand the natives make a tea from the leaves.

A. anserinifolia is closely allied to *adscendens*, but the latter is more glabrous, the leaflets are rounder, more glaucous, and more deeply toothed; the flower stalks are longer and stouter; the bristles are shorter and stouter, and the achenes are narrowed at both ends.

917 *A. adscendens* Vahl Enum. i. 297, 18, 1804.

Fl. Antarctica ii. 268, t. 96.

New Zealand—in the mountain region from 1000-2300 metres, Canterbury and Otago Lake district, Macquarie Island; Tierra del Fuego, Falkland Islands, Patagonia, Chile.

Prostrate, glabrous or slightly hairy, with stout leafy stems; leaves 5-10 cm. long; leaflets 4-6 pairs, coriaceous, coarsely and deeply cut towards the obtuse tip, cuneate at base, teeth obtuse, often tipped with silky hairs; flowers greenish, in globular heads, about 1.25 cm. in diameter; calyx-tube 4-angled, the angles produced into purple bristles barbed at the tip. This differs mainly from the preceding species in the usually glabrous, not silky leaves, often glaucous, and the achenes narrowed at both ends.

First record; Several seedlings at Galafoot in 1908. One, transferred to a garden, flowered this year. J. Fraser in *Ann. Scot. Nat. Hist.* 100, 1911. This does not perfect fruit. These die off in July in Mr Fraser's garden at Leith. Named at Kew.

33 CRASSULACEAE DC.

A family of about 500 [D. T.] species and 15 genera consisting mainly of herbaceous or suffruticose exstipulate herbs or shrubs, which are often succulent or fleshy, rarely pilose or pubescent. The flowers are regular; stamens 1-2 seriate; ovary superior, with distinct carpels; flowers terminal, rarely axillary. Widely dispersed through the sub-tropical and temperate regions of the eastern continents, but specially represented in South Africa and in rocky districts of S. Europe and Asia. The only Australian genus is *Tillaea*.

188 **TILLAEA** (Mich.) L.

A small genus, named after M. A. Tilli, the author of *Catal. Pl. Hort. Pisani* 1723, of about 20 species, very closely allied to *Crassula*, into which it is merged in the *Genera Siphonogamarum*. It differs in the 3-5-merous flowers, annual duration, and minute size.

1006 T. Vaillantii Willd. Sp. Pl. i. 720, 1797.

Crassula Vaillantii Baillon. *Bulliardia Vaillantii* DC. Fig. 15.

In marshes and damp siliceous soil in Belgium, France, Spain, Portugal, Austria, Italy, Malta (var.), Algeria, Abyssinia, Cape of Good Hope.

A small, slender, upright, more or less branched, ordinarily tufted, reddish annual, 2-6 cm.; flowers small, tetramerous, whitish-rose, in irregular, often unilateral cymes with flower-stalk longer than the opposite, connate, thick, linear-oblong, rather obtuse leaves; fruit many seeded.

First record: Near Galashiels, Selk., I. M. H., September 1909. Named by Dr Stapf. See *Rep. B. E. C.* 414, (1909) 1910. Found abundantly during seven successive years on moist sandy soil by the sides of the Gala and Tweed, near Galashiels, Selk. Flowering July to September. Stuart (*Proc. Berw.* 74, 1869) records a species of *Tillaea* from the banks of the Gala, the identity of which is quite uncertain.

1006 (3) T. Sieberiana Schult. Mant. iii. 345, 1827.

T. verticillaris DC. Prod. iii. 382. *T. pedunculata* Sieber, not of Willd. *Crassula Sieberiana* Druce.

Queensland—Brisbane River, &c.; New South Wales—Blue Mountains, in the interior to Barrer Range; Victoria—Melbourne; Tasmania; South Australia—from Port Bugle to Barossa Range; West Australia—King George Sound, &c.; New Zealand—abundant throughout in dry, rocky or gravelly places.

A small annual, at first simple, but when old much branched, forming dense tufts, 7-10 cm. across; leaves ovate-lanceolate or linear, connate at base, 3-4 mm. long; flowers very small, many of them nearly sessile, others very shortly stalked, in dense axillary clusters; sepals usually 4, rarely 5, acute or aristate; petals very minute; fruits without scales, very obtuse, not longer than calyx, with 1-2 seeds.

First record for Tweedside, Selk.: I. M. H., September 1912. Found in the same localities as the last, but rather less plentifully. It flowers at the same time.

1006 (4) T. pharnaceoides Hochst. in Schimper Hb. Abyss. 104, ex Britten in Fl. Trop. Afr. ii. 387.

Crassula pharnaceoides C. A. Mey. *T. trichopoda* Fenzl. *Combesia abyssinica* A. Rich. Fl. Abyss. i. 307, 1847.



Fig. 15.

TILLAEA VAILLANTII Willd.

In damp places in Persia, Peshawar, Punjab Plains, Abyssinia, Cameroon mountains at 2,900 metres.

Annual; stem decumbent or erect, branched, leafy, internodes longer than leaves; leaves ovate-lanceolate or lanceolate-acuminate, 4-8 mm. long, cuneate at base; flowers in dense axillary clusters, stalked; fruits reddish.

First record: Galafoot, Selk., J. Fraser, 1908. See *Rep. B.E.C.* 502, (1910) 1911.

36 LYTHRACEAE Lindley.

A family with about 300 species [389 Uphof, 365 Dur.] and 30 genera [24 D. T.] of very variable habit, natives chiefly of tropical America, the herbaceous species being world-wide. They are of little economic value, except *Lawsonia inermis*, from which the dye, henna, is prepared, which is so largely used in the east to stain the fingers. The flowers, often conspicuous, are hermaphrodite, clustered or solitary in the leaf-axils, sometimes spiked or racemose, bracteate. The leaves are simple, entire, exstipulate, opposite or whorled, rarely opposite and alternate on the same plant.

198 LYTHRUM L.

A small genus of about 25 species, widely spread over the globe, annual, perennial or suffruticose, having a tubular calyx and 2-celled ovary; flowers solitary or 3-5, sessile or stalked in the leaf-axils, pink, purple, or white, with long filiform styles. The name is derived from *lythron*, black blood, from the colour of the flowers in one of the species.

1044 *L. meonanthum* Link in Schrad. Neue Journ. ii. 100, 1808.
L. acutangulum Lag. *L. Graefferi* Tenore. *L. flexuosum* Lag.
Fig. 16.

Perennial, 2-6 dm., glabrous, prostrate, rooting at the base; flowers axillary, trimorphous, solitary in the leaf-axils; petals purple, acute, longer than calyx, which has 12 unequal teeth.

In damp places and by the borders of streams in central Europe, Portugal, France, Spain, Italy, Malta, Greece, Crete, Rhodes, Asia Minor, Egypt, Abyssinia, N. Africa, Madeira, Azores, Canaries, New Zealand—North and South Islands.

First record: Selk., I. M. H., 1911. Found on an island near the mouth of the Gala, also beyond its confluence by the side of the Tweed, Selk. Flowering July to September. Det. G. C. Druce.

1045 *L. Hyssopifolia* L.

Grass Poly.

Syme E. B. iv. t. 492.

In damp ground in central and south Europe, from England eastwards (perhaps adventive) through Asia to Soongaria, Assyria, Syria, Abyssinia, Egypt, Tunis, Algeria, Morocco, Cape of Good



Fig. 16.

LYTHRUM MEONANTHUM Link,

Hope, Azores. Adventive on salt marshes, Maine, U.S.A. In California, Chile, &c.; New Zealand, where it is abundant; Australasia.

- A prostrate, canescent or glaucous annual, with terete stem and angular branches, 5-50 cm. long; leaves alternate, linear; petals small, ligulate or obovate-obtuse; fruit calyx 4-7 cm. long, narrowly tubular, 8-veined.

First record: Banks of Gala, Selk., Stuart in *Proc. Berw.* 1869-72. Found plentifully by I. M. H. each year since 1908, along the banks of the Gala and at the Skin-works in Galashiels, Selk., also by the Tweed for eight miles, Roxb., often very luxuriant, branching freely and occasionally attaining the dimensions of a metre. Flowering July to September.

37 EPILOBIACEAE Ventenat.

Onagrariae Juss. *Onagraceae* Lindley.

A family comprising about 500 species [330 Dur.], divided into 23 genera, dispersed over the globe, consisting of annual, biennial or perennial herbs, shrubs and even trees, of little economic value, but containing many beautiful garden plants such as those in the genera *Fuchsia*, *Clarkia* and *Oenothera*. The leaves, opposite or alternate, are exstipulate and usually entire, serrate or very rarely divided; flowers usually solitary in the axils or in leafy racemes or spikes, regular, epigynous; sepals and petals 2-4, convolute; stamens 2-4 or 8; fruits mainly capsular.

202 OENOTHERA L.

Onagra Adans.

A large, ornamental, and somewhat critical genus [about 140 species, Uphof; 40 D. T.; 100 Dur.] found chiefly in South, Central, and North America, one species being endemic in Tasmania. It has been subdivided into several genera or sub-genera, but it is here treated in an aggregate manner. It differs mainly from *Epilobium* in having no tuft of hairs on the seeds. The calyx is 4-cleft, with the segments joined below and greatly elongated, the limb deciduous; petals 4; stamens 8; fruit (capsule) dehiscent longitudinally, many-seeded; flowers conspicuous, mostly yellow, pink, red, or purple, affording attractive hardy garden plants of no economic value. The name is derived from *oinos*, wine, from its odour.

- 1065 *Oe. odorata* Jacquin Ic. Pl. Rar. iii. 3, } *Evening Primrose*.
t. 456, 1786-93.

Oe. mollissima L., sub-sp. *odorata* Thell. Fl. Adv. Montp. 390.
Oe. polymorpha Léveillé, race *odorata* Léveillé. Syme. F. B. iv. 509.

Chile—Valdivia ; Argentina—Chica de Cordoba ; Ecuador ; Peru—Callao. Adventive, but naturalised in Britain, Somerset, etc., and Jersey ; India—Nilghiris ; Japan—between Kobe and Osaka (!) ; New Zealand—North Island.

This differs from the common *Oe. biennis* of the gardens in its deeper yellow blossoms which turn a reddish brown on withering. The leaves are somewhat glaucescent, more toothed, and much narrower, being of the same width throughout except at the base, where they are attenuate. The plant is more rigid, and shorter, the seeds smaller, less angular, and of a paler brown. Although this and other *Oenotheras* are included here it may be open to question whether they have actually been introduced with wool.

First found on Tweedside by I. M. H. in 1913 at Galashiels Skin-works, and also along the banks of the Gala, Selk., and Tweed, Roxb. A striking plant by reason of its foliage and bright orange flowers. Flowering September to October.

1070 (3) *Oe. longiflora* L. Mant. ii. 227, 1771.

Jacquin in Ic. Plant. Hort. Schoenbr. 81, t. 172, 1797. Bot. Mag. t. 365.

Sandy soils in South America : Uruguay—Monte Video ; Brazil—in the littoral of the north part of the province of Rio Grande do Sul. Adventive in the mountains of St Andrew's, Jamaica ; Macao (as *fruticosa* Hance) ; France—Basses Pyrenées, Landes.

A biennial with stout stem, 5-10 dm., often marked with red ; leaves usually with soft hairs, glabrescent or hairy on the nerves, the radical long-stalked, spathulate, upper oblong or lanceolate, denticulate, floral leaves oval ; calyx tube hairy, narrowly cylindric, 7 cm. long, the free part, 3-5 cm., three times the length of the calyx ; petals large, 3-5 cm. long, somewhat orbicular, sessile, emarginate, golden yellow, turning reddish on drying, shorter than the calyx tube ; fruit 50-55 mm. long by 5 mm. broad, tetragonal, truncated at apex, very hairy.

First record for Britain : I. M. H., 1911. See *Rep. B.E.C.* 162, (1912) 1913. Found at the Skin-works, Galashiels, and abundantly at the junction of the Gala and the Tweed, Selk., and on a recently made embankment on the Tweed a mile further on, Roxb., for successive years. Flowering September to October. Det. R. A. Rolfe.

Introduced to British gardens in 1776 by Chevalier Murray.

41 UMBELLIFERAE (Morison) B. Jussieu.

Ammiaceae Presl. *Apiaceae* Lindley.

An enormous family [2177 species Uphof, 1400 Dur.], and despite the large number [250 D. T., 180 Dur.] of genera, a very natural one,

since the inflorescence and the floral structure distinguish it from all others except the Araliaceae, which, however, have either more than two styles or a baccate fruit. The fruit, usually separating into two indehiscent 1-seeded carpels, is a characteristic feature. The limits of the genera are very difficult to define and are in many instances artificial. The Umbelliferae consist mainly of herbaceous plants. They are rarely shrubby, and there are only a few arboreal species. They are spread over the world, but thin out in arctic as in tropical regions. Their headquarters are in western Asia and the Mediterranean area. Many species contain an essential oil, hence they are of some economic importance—*e.g.*, Caraways, largely used as a condiment, the oil entering into the Russian liqueur, Kümmel; Anise, largely used in the Spanish liqueur of that name; Fennel; *Anethum* with carminative properties; *Cuminum* and *Coriandrum*, used in curry. Others have poisonous properties, such as *Conium*, which contains a liquid alkaloid. *Cicuta* and *Oenanthe crocata* are two of our few poisonous native species. *Ammoniacum*, *Asafoetida*, and *Galbanum* contain gum-resin, and are used medicinally. From *Ptychotis copticum* thymol is obtained. Celery, Parsnip and Carrot are well-known culinary vegetables.

217 BUPLEURUM (Tourn.) L.

This genus, of which about 75 species have been described, is well characterised by its entire leaves with parallel veins. Its head centre is in the temperate regions of the Eastern Hemisphere, extending into Socotra and South Africa. The name signifies ox-ribbed, from the strongly-veined leaves of some species.

1094 (2) **B. semicompositum** L. (Diss.) Amoen. Acad. iii. 405, 1756, var. **typicum** Fiori et Paoletti Fl. Anal. Ital. ii. i. 155, 1900.

In dry fields, calcareous and sandy soils, especially near the coast, in Spain, Portugal, Liguria, Italy, Greece, Turkey, S. Russia, Orient, Egypt, Algeria, Canaries. Adventive in France at Port Juvenal, where Delile found it in 1824. G. C. Druce collected it on sandy ground near the port of Itaea in the Gulf of Corinth in 1914.

A small, dichotomously-branched annual, with linear or oblong-lanceolate leaves; umbels unequal, 3-5 rayed; involucre bracts somewhat longer than flowers, not glumaceous, 3-nerved, linear-lanceolate; fruit stalked, nearly globular, minutely tuberculate-granulate, with nearly equal ribs. Nearly allied to *tenuissimum* but differing in the flowers of the umbel being shortly stalked, the darker yellow petals (often tinged with red or purple), the fruit tuberculate and smaller, and the ribs obliterated.

First record: Banks of Tweed, two miles below Roxburgh, September 1913, I. M. H. in *Rep. B.E.C.* 324, (1913) 1914. Of frequent occurrence. Flowering September to October. Det. A. Thellung.



Fig. 17.

APIUM AMMI Urban.

219 APIUM (Tourn.) L.

A genus, including *Helosciadium*, of about 25 species [15 Dur.], world-spread, but inconspicuous in appearance, and with the exception of Celery of no economic importance. They are mostly biennial and are marked by the regular compound umbel with bracts or bracteoles sessile or subsessile, entire carpophore, small broadly ovate fruit without prominent secondary ribs and solitary oil tube. The name is said to be derived from the Celtic *apon*, water.

1097 (2) A. Ammi Urban in Mart. Fl. Bras. xi. i. 341, var. *a*.

Sison Ammi L. Jacquin Hort. Vindob. t. 200, 1772. *Helosciadium leptophyllum* DC

Brazil, Chile—Valdivia, Mexico, San Domingo (DC.).

A glabrous species with the leaves ternately cut into capillary lobes; umbels opposite to the leaves, 2-3 rayed; the secondary umbels stalked, without involucre.

First found in Britain in 1913, I. M. H. See *Rep. B.E.C.* 324, (1913) 1914. Banks of Tweed for four miles between Galashiels and Melrose, Roxb. Flowering September to October. Exhibited at the Linnean Society April 2, 1914.

221 AMMI (Tourn.) L.

A small genus of about 10 species growing chiefly in the Mediterranean region, the Azores and Canaries, with compound umbels; ovate or oblong fruit with filiform ribs; involucre of many trifid or pinnatifid leaves, and leaves dissected into capillary lobes. The name is said to be derived from *ammos*, sand.

1102 A. Visnaga (L.) Lam. Enc. i. 132, Dec. 1783.

Daucus Visnaga L. Jacq. Hort. Vindob. iii. t. 26. Fig. 17.

Field borders and untilled ground in Portugal, Spain, France, Italy, Albania, Greece, Turkey, Macedonia, Persia, Caucasus, Syria, Palestine, Abyssinia, Egypt, Madeira, Canaries. Adventive in Germany, etc., Chile—Coquimbo, Argentine, &c.

Annual, with finely divided leaves spreading in a fan shape, umbels very dense, with numerous, long (2-4 cm.), stiff rays spreading in flower but closely contracted in fruit, rising from a dilated disc. These umbels are sold to serve as toothpicks in Greece, &c., hence the Mexican-Spanish name, *Visnaga*.

First record for Tweedside: I. M. H., 1908, in *Tr. Bot. Soc. Edin.* 41, 1909. Found frequently and abundantly at Galashiels Skinworks, and along the banks of the Gala, Selk., and Tweed, Roxb. Of strong growth. Flowering September to November.

232 ANTHRISCUS Bernh. Syst. Pflanz. Erfurt 113, 1800.

A small genus [13 species D. T.] closely allied to *Chaerophyllum*, with which it is often united, of white-flowered species found in

the temperate and sub-tropical areas of the Northern Hemisphere of the Old World, having linear fruit, usually beaked, with styles shorter than the stylopodia. The name is used by Pliny for an umbelliferous species.

1127 A. Scandix Beck Pl. Hernst. 211.

A. vulgaris Bernh., *l.c.* *Scandix Anthriscus* L. *Caucalis Scandix* Scop. 1772. Syme E. B. iv. t. 622.

Under hedges, by waysides and in uncultivated ground (in Spain, Croatia, &c., in thickets) throughout Europe, except Norway, Finland, N. Russia, Greece and Turkey, but often adventive; Asia Minor, Caucasus, Taurus, Mesopotamia.

A pretty species with elegantly cut leaves of a bright light green colour, sparingly clothed with cartilaginous hairs, especially noticeable in the young state. The fruits are surrounded by a ring of hairs at the base. The angular beak is glabrous, but the mericarps are thickly covered with short, incurved, rough spines. These readily adhere when ripe to animals. Doubtless this plant, which appears native in England, is introduced to Tweedside in wool.

First record: Bank on roadside at Primsidé Mill, Roxb., A. Brotherston in *Rep. Bot. Rec. Club* 60, 1874. First record for Selk., I. M. H., 1914. Found on banks of Gala and on wool waste heaps in mill grounds, Selk., and by the side of the Tweed 1½ miles below Galashiels, Selk. Flowering July to August.

250 CORIANDRUM (Tourn.) L.

A small genus of 2 or 3 annual, glabrous species, very distinct in the subglobose or ovoid shape of its glabrous fruit. Found in the east and south of Europe and the Orient.

1157 C. sativum L.

Coriander.

Syme E. B. iv. t. 632.

Largely cultivated and sometimes sub-spontaneous in most of the European countries, Egypt and India, and perhaps native in Portugal, S. Italy, Greece and Turkey, Transcaucasia, Palestine, Syria, Arabia, Mesopotamia, Beluchistan, India, China, Egypt, Canaries.

A glabrous annual, with an intolerable bug-like odour (hence the name) which disappears on drying, with compound umbels of a few rays, bracts absent or small and linear, the bracteoles few, linear; flowers 6-7 mm. across, white, often tinged purplish-pink; fruit globular, not splitting into mericarps when ripe. It furnishes the well-known condiment which enters into curries, and it is made into cakes or sprinkled on the tops of cakes in Italy and elsewhere. Fruits were found in Roman Silchester, introduced doubtless for such purposes. Whether the few speci-

mens found on Tweedside were introduced in wool is open to doubt.

First record: Tweedside, Kelso, Roxb., A. Brotherston in *Rep. Bot. Rec. Club*, 141, 1875. First record for Selk., I. M. H., 1912. Found rarely among herbage near the confluence of the Gala and Tweed. Flowering July to August.

252 DAUCUS (Tourn.) L.

A genus of about 60 species, chiefly Mediterranean, but spreading into temperate Asia, N. Africa, America and Australia. It consists mainly of annuals or biennials with pinnately decomposed leaves, umbels regularly compound, and with the general and partial involucral bracts of several dissected or linear divisions. The name is the old Greek appellative.

1161 D. gummifer Allioni Misc. Taur. v. 182, 1774, not of Lam. Syme E. B. iv. t. 616.

In grassy turf on the coasts of S. England, Ireland, Portugal, Spain, France, Italy, Dalmatia, Macedonia, Greece, Anatolia and N. Africa.

Closely allied to the common carrot, but differing in the broader involucral bracts, in the mature umbel being convex not concave, and in the thicker leaves with broader segments.

First record: Tweedside, near Melrose, Roxb., Stuart in *Proc. Berw.* 177, 1869-72.

1161 (2) D. glochidiatus (La Bill.) Fisch. Mey. & Avé-Lall. Ind. Sem. Hort. Petr. ix. Supp. ii.

Scandix glochidiata La Bill. Pl. Nov. Holl. i. 75, t. 102, 1804.

Daucus brachiatus Sieb. in DC. Prod. iv. 214, 1830. Fig. 18.

Australasia: Queensland; New South Wales—Port Jackson to the Blue Mountains, Darling and Lachlan Rivers; Victoria—by the Murray River; Tasmania—common in the northern parts of the island; South Australia; West Australia—King George Sound and thence to the Swan River; New Zealand—abundant in lowland districts throughout Chatham Island.

An erect or decumbent annual, sometimes small and slender, or stout, 3-7 dm., more or less hirsute with short stiff hairs; leaves with slender stalks, bi-pinnate, with short, narrow, incised or pinnate segments, usually minutely mucronulate; umbels of 3-5 unequal rays, with 2 or 3 involucral bracts, divided into 2 or 3 linear, subulate segments, one of the rays sometimes growing out into a continuance of the stem and bearing another compound umbel; fruit ovoid, varying much in size, usually about 4 mm. long, with short bristles, sometimes 6 mm., the bristles long and very fine, or stout and dilated at the base. Benth. *Fl. Austral.* iii. 376.



Fig. 18.

DAUCUS GLOCHIDIATUS (La Bill.) Fisch. Mey. & Avé-Lall.

The Scottish plants are about 2-3 dm. high, with a root 7.5 cm. long, the petals edged with dark pink and ciliate with white hairs. The fruits have been found in the wool from New South Wales and West Australia, thus proving their origin.

First record for Britain: *D. brachiatus*, I. M. H. in *Rep. B.E.C.* 503, (1910) 1911. Found in August 1908, and subsequently in many places by the Gala and Tweed, near Galashiels, Selk., also by the Tweed near Melrose, Roxb. This is one of the wool aliens of most frequent occurrence, due no doubt to the circumstance that the fruits are present in wool from all parts of Australia, the bristly covering easily adhering to the fleece (Fig. 19). Flowering July to August. Exhibited at the Linnean Society, April 2, 1914. Det. A. Thellung.



Fig. 19.

DAUCUS GLOCHIDIATUS (La Bill.) Fisch. Mey. & Avé-Lall. Fruit.

1161 (3) *D. sp. cf. Durieua* Lange in Willk. & Lange *Prod. Fl. Hisp.* iii. (sect. 1.) 23, 1874, teste A. Thellung.

Durieua hispanica (Lam.) Boiss. et Reuter *Diag. Pl. Hisp.* 14.
Caucalis hispanica Lam. *Enc.* i. 658.

Among rocks, on dry hills and in uncultivated fields from 1000-1500 metres in Spain and N. Africa.

The plant has subsessile umbels and short styles, the fruits covered with white bristles and yellow secondary prickles, the apex stellate-glochidiate.

First found in Britain by I. M. H., July 1908. Found during successive years on the banks of the Gala, Selk., also along the Tweed, between Galashiels and Melrose, Roxb.

A plant with the habit of *Caucalis latifolia*, intermediate in character with that genus, and made the type of a new genus by Boissier and Reuter, who named it after Durieu, the well-known Algerian explorer. If *Daucus hispanicus* Gouan (*Ill.* 9) is not distinct from *D. Gingidium*, the name for the above plant is *D. hispanicus* (Lam.), comb. nov.

253 CAUCALIS L.

A genus of about 80 species [5 Uphof and D. T., 20 Dur.] chiefly Mediterranean, but widely scattered over the globe. The flowers are in regular umbels; the fruits compressed or nearly cylindric with the primary and secondary ribs terminating in lobed crests or bristles or prickles, more rarely entire, and the secondary more prominent than the primary; flowers white, whitish or reddish. The name was used by Pliny. Linnaeus thought it was derived from the Greek word, "to trail along."

1165 *C. leptophylla* L.

Torilis leptophylla Reichb. Ic. xxi. p. 83, t. 2010.

In fields, on the borders of roads and in cornfields in France, Spain, Liguria, Italy, Adriatic coast, Greece, Turkey, W. Asia, Palestine, Persia, Mesopotamia, Afghanistan, Kashmir, Punjab—to 2000 metres, Egypt, Tunis, Algeria, Morocco, Canaries.

A slender annual, 2-5 dm., dichotomously branched, resembling *daucoides*, but having more slender stems and branches with reflexed hairs; the leaves smaller; the umbels on shorter stalks; the flowers small; the fruit very small, with prickles in 2 or 3 rows, very rough and hooked at top.

First record: Galafoot, Selk., I. M. H. Det. J. Fraser, 1908, in *Tr. Bot. Soc. Edin.* 41, 1909.

1169 *C. nodosa* (L.) Scop. Fl. Carn. i. 191, 1772. *Knotted Parsley*.

Tordylium nodosum L. Syme E. B. iv. t. 621.

In dry, sunny places, fields, banks and waysides throughout central and southern Europe (not in Scandinavia, Denmark, or N. Russia) extending eastwards to Persia and Afghanistan. In N. Africa, Egypt, Canaries. Adventive in California, where it was introduced from Chile and Peru; Chile; Peru; New Zealand—North and South Islands.

A small, wiry, more or less zig-zag, strigosely hairy annual, 1-5 dm., readily distinguished by its sessile or subsessile umbels situated opposite the leaves, consisting of 2 or 3 very short rays, and having no involucre. The mericarp of the fruit is covered with numerous, spreading, straight, subulate spines, hooked at the apex. The plant with stalked umbels is var. *pedunculata* (Rouy) Druce.

First record: Field near Ednam, Roxb., A. Brotherston in *Rep. Bot. Rec. Club* 60, 1874. Not a wool introduction. First record for Selk., I. M. H., 1913. On a shingly islet in the Gala, $\frac{3}{4}$ -mile below Galashiels, also near its junction with the Tweed. Flowering August to October.

45 RUBIACEAE Jussieu.

An enormous family of 4580 species [4100 B. & H.], divided into 372 [397 D. T.] widely differing genera, some herbaceous, some shrubs, occasionally climbers, and others large forest trees. Some, such as *Galium* and *Rubia*, have small, inconspicuous flowers, others like *Gardenia*, *Ixora* and *Rondeletia* are among our most showy species. It includes such important economic products as coffee, and the dye, madder. One of the most important medicinal substances, quinine, is obtained from the genus *Cinchona*. The emetic, Ipecacuanha, is a species of *Cephaelis*. The family is most strongly represented in tropical and sub-tropical America, but is spread over the whole world. The leaves are opposite or verticillate; stem simple, usually entire; flowers usually tetramerous or pentamerous; corolla gamopetalous, salver, bell-shaped or rotate, rarely urceolate or tubular; fruit a berry, capsule or drupe or dry, composed of two spherical mericarps.

265 GALIUM L.

A large genus of about 300 [D. T.] critical species spread over the world, consisting of annual or perennial herbs with square stems; verticillate leaves; flowers small, hermaphrodite or polygamous, forming ebracteate, terminal or axillary cymes; corolla rotate, 4-lobed, valvate in bud; stamens 4, inserted on corolla tube; ovary 2-celled; fruit dry, smooth, rugose or tuberculate, glabrous or hispid. The name comes from *gala*, milk, some species having the property of curdling milk.

1202 (2) *G. murale* Allioni Fl. Pedem. i. 8, t. 77, f. i. 1785.

Sherardia muralis L. Sibth. Fl. Graeca t. 115, 1813.

On rocks and walls in south Europe—Portugal, Spain, France, Italy, S. Austria, Dalmatia, Greece, Turkey; Syria, Asia Minor, Egypt, Tunis, Algeria, Canaries, Madeira. Adventive in Chile—Cordillera de Santiago, 1862.

An annual, 5-30 cm., tufted, flaccid, filiform, glabrous or hispid-scabrous; leaves 3-5 mm. long, the lower in 4's (rarely 5's-6's), the upper in pairs, opposite; flower-stalks extra-axillary, terminal, reflexed after flowering; fruits cylindric; mericarps oblong or ovate, hirsute, especially at the top, with long, whitish, uncinate hairs.

First record: Galashiels, Selk., I. M. H. in *Rep. B. E. C.* 325, (1913) 1914. Found abundantly in August 1913 at the junction of the Gala and Tweed, Selk. Flowering July to October.

1204 *G. anglicum* Hudson Fl. Ang. 69, 1778.*G. parisiense* L., p.p. Syme E. B. iv. t. 656.

In dry fields and hilly places in E. England, Portugal, Spain, France, Germany, Switzerland, Italy, Austria, Adriatic coast, Bosnia, Transylvania, Serbia, Turkey, S. Russia, Caucasus, Persia, Asia Minor, N. Africa, Canaries, New Zealand—North and South Islands.

A slender, glabrous annual without barren shoots, with hooked prickles on the stem angles; leaves narrow, oblanceolate, acuminate and mucronate, firm, 6 (usually) in a whorl, glabrous, but with a few prickles on the margin; fruit very small, glabrous, granulate; flowers greenish-white, very small, inconspicuous.

First record: Among shingle by the side of the Tweed on Lowwood Estate, Roxb., Stuart in *Proc. Berw.* 78, 1869.

46 VALERIANACEAE Lindley.

A widely scattered family of nearly 310 species and 12 genera, best represented in temperate climates. A few are found in extra tropical South America, and others in Brazil and East Indies. They are of little economic importance, but one of the species yields the drug which gives its name to the order. A few hardy perennials are garden plants. The corolla is usually white or pink, 5-cleft, with a short tube and spreading limb; the calyx, at first entire, forms a feathery crown in the fruiting season, resembling a plumed pappus. Linnæus thought the name was derived from King Valerius.

272 VALERIANELLA (Tourn.) Miller Gard. Dict. Abr. 1754.

In this genus of about 50 species [D. T.] the calyx-limb is dentate or crown-like in fruit; the corolla is regular or gibbous at the base; stamens usually 3, inserted about the middle of the tube; stigmas trifid. The plants are annual, dichotomously branched; flowers small, sessile, solitary at the apex of the branches, crowded in sub-fastigiate or subglobose bracteate cymes; fruit of three loculi, two of which are sterile, the third having a solitary seed.

1223 *V. eriocarpa* Desv. Journ. de Bot. ii. } *Italian Corn Salad.*
314, t. ii. f. 2.

Syme E. B. iv. t. 673.

In fields, cultivated ground, &c., in England, Belgium, Portugal, Spain, France, Germany, Switzerland, Italy, Dalmatia, Herzegovina, Transylvania, Greece, Asia Minor, Persia, Tunis, Algeria, Canaries. The plant is a doubtful native of England, Belgium, and Germany, and is often adventive elsewhere.

It bears a resemblance to *V. dentata*, but the flowers have a more racemose appearance; the barren loculi converge less toward the top and the calyx limb is much larger and distinctly reticulated,

being nearly as long and as broad as the fruit, which is usually pubescent.

First record for Selk.: Bed of the Gala a little below Galashiels, Stuart in *Proc. Berw.* 77, 1869-72. First noticed in England at Worcester in 1845.

1228 V. discoidea Lois. Not. 148.

Valeriana Locusta, var. *discoidea* L.

In cultivated and waste ground, often among corn, in the Mediterranean region—Portugal, Spain, France, Italy, Dalmatia, Crete, Greece, Turkey, Asia Minor, N. Africa, and in Madeira.

Calyx limb nearly regular, hypocrateriform, softly hairy on two sides, longer than fruit, concave, sub-rotate, divided into six spreading lobes, which are sometimes bifid, terminated by a long uncinat point; fruit short, obconical, sub-trigonus, villous; sterile locules divergent.

First record for Selk.: I. M. H., 1913. Found on an islet on the Gala, $\frac{3}{4}$ -mile below Galashiels. Flowering August to September. Det. A. Thellung.

48 ASTERACEAE Lindley. **COMPOSITAE** Adans.

The largest family with about 900 genera [766 B. & H., 899 D. T.] and nearly 15,000—some authors say 20,000—species. It is world-spread, and represented in all kinds of habitats from the extreme limit of Arctic vegetation in the north to the Equator and thence to the limit of plant life in the Antarctic regions, and from the sea level to high Alpine situations. They are mostly herbaceous or shrubby plants, only a few being arborescent. The family is singularly deficient in plants of economic value either for the arts, food or medicine. Among the edible species may be mentioned the Jerusalem Artichoke, *Helianthus tuberosus*; the common Artichoke, *Cynara Scolymus*; the Cardoon, *C. Cardunculus*; the Lettuce, *Lactuca sativa*; Salsify, *Tragopogon porrifolius*; and Chicory, *Cichorium Intybus*. Oil is produced in great quantity from the Sunflower, *Helianthus annuus*, which has been used for that purpose in Mexico for many ages. *Madia sativa* is also employed for the same purpose. Among the medicines are *Arnica montana*; the Camomile, *Anthemis nobilis*; and the Dandelion. The vermifuge, Santonin, is obtained from a species of *Artemisia*, a genus which also supplies one of the ingredients in the French liqueur, absinthe. The garden plants include the Asters, Dahlias, Zinnias, Chrysanthemums, Sunflowers, Marigolds, Cinerarias, and Centaureas and plants of this order are conspicuous in the gay vegetation of the prairies of North America. The family is well characterised by the syngenesious anthers (except in the anomalous *Ambrosia*); the flowers collected into a capitulum; the calyx usually absent, or if present existing as a pappus often feathery; the 5 stamens; the ovary with one loculus and erect ovule.

279 (2) BRACHYCOME Cass. in Dict. Sc. Nat. xxxvii. 491, 1825.*Brachyscome* Cass. in Bull. Soc. Phil. 199, 1816.

A genus of about 50 species, chiefly Australasian and New Zealand, a very few extending into Asia and tropical Africa, allied to *Bellis*, into which Uphof merges it, but kept distinct in *Gen. Siphon*. Characterised by the involucre bracts being membranous at the margin, the receptacle pitted, naked; fruit flattened, surmounted by a very short bristly pappus. The name is derived from *brachy*, short, and *kome*, hair.

1245 (10) B. collina Benth. Fl. Austral. iii. 521, 1866.*Silphiosperma collinum* Sonder in Linnaea xxv. 483, 1852.

Australia: Victoria—Wimmera, &c.; South Australia—Holdfast Bay, &c.; West Australia.

A small, erect, branching annual, rarely exceeding 5 cm., glabrous or slightly pubescent; leaves small, linear, pinnatifid, with short, mucronate lobes, the lower lobes reduced sometimes to short cilia; flower-heads about 4 mm. diameter; involucre bracts few, ovate, the scarious margins very narrow, the inner bracts more oblong; florets not longer than involucre, those of the ray with a very small ligule, scarcely so long as the style; achenes obovate, as long as the involucre, very flat, bordered by a wing divided into linear lobes, hooked at the end; the disk sprinkled with a few hairs. Benth. *Fl. Austral.* iii. 521.

First found in Britain by the Gala, Galashiels, Selk., I. M. H., August 1913. See *Rep. B.E.C.* 325, (1913) 1914. It grew on moist alluvial soil near the mouth of the Gala, but rare. Flowering August to September. Exhibited at the Linnean Society April 2, 1914.

As Thellung (*Fl. Adv. Montp.* 616) wisely remarks, the fringed wing to the fruit affords a ready way for its adherence to the wool, and its occurrence in 1905 in the bed of the river Orb near Montpellier is attributable to the adjacent wool-washing.

280 CALOTIS R. Br. in Bot. Reg. t. 504, 1820.

An Australian genus of about 20 [16 D. T.] species allied to *Bellium*, named from *kalos*, beautiful, and *otos*, an ear, from the chaffy scales of the pappus. They are mostly herbaceous perennials, rarely annual.

1246 C. cuneifolia R. Br. in Bot. Reg. t. } *Burr, Carrot Seeds.*
504, 1820. Fig. 20.

Dry sandy ground, Australia: Queensland—Sutton River, Burdekin River; New South Wales—Port Jackson to the Blue Mountains; South Australia—Murray River.

An erect or spreading, branching perennial, rarely attaining 3 dm., more or less hoary, scabrous-pubescent or hirsute; leaves oblong,

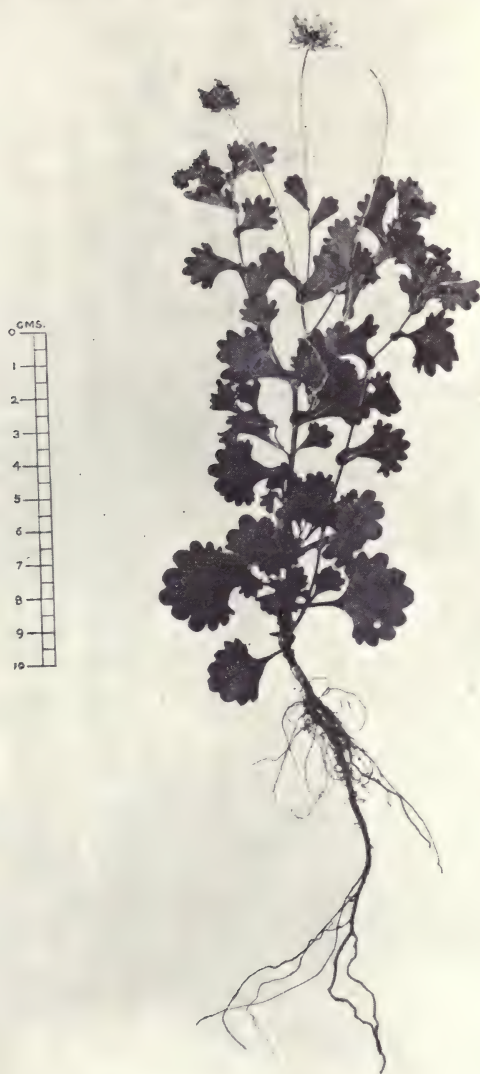


Fig. 20.

CALOTIS CUNEIFOLIA R. Br.

cuneate or spatulate, sometimes orbicular, coarsely toothed, narrowed into a short or long petiole dilated into stem-clasping auricles; flower-heads hemispherical, becoming globular when in fruit, on terminal peduncles; involueral bracts oval-oblong or lanceolate, about two lines long; ray florets long and narrow; achenes flat, short, obovate; pappus of three rigid barbed bristles or awns and two broad membranous truncate scales, quite distinct, with sometimes a third smaller one; disk achenes abortive; fruiting-heads forming a globular burr of three or four lines diameter. Benth. *Fl. Austral.* iii. 502.

First record for Selk. and Roxb., I. M. H., 1913. Found in the bed of the Gala within the township of Galashiels; at the junction of the Gala and Tweed, Selk.; along Tweedside near Melrose; also four miles further down the river, Roxb. It was specially abundant in the autumn of 1913. This plant has been reported as found on woollen waste-heaps in Yorkshire. Despite their extreme dissimilarity the fruits are known in the wool trade as "Carrot Seeds." Flowering August to October. Exhibited at the Linnean Society April 2, 1914. Det. A. Thellung.

It infests sheep pastures in many parts of Australia and New Zealand. Its seeds cling by means of their barbed bristles to the sheep's wool, and, becoming inextricably entangled, are imported with the wool into this and many other countries. The pest is known as the "Burr" to sheep-farmers and as "Carrot Seeds" to wool dealers in consequence of their conical shape. It has been recorded in England in connection with wool refuse. Dunn *Alien Fl.* 106.

1247 C. hispidula F. v. Mueller in Trans. Vict. Inst. 130, 1855.

Cheiriloma hispidulum F. v. Muell. Fig. 22.

Australasia: New South Wales—Molle's Plain, Upper Logan and Lachlan River, Darling River, &c.; Victoria—Wimmera; South Australia—Crystal Brook, Cudnaka; West Australia—Bullahulling, Coolgardie, Swan River.

A hispid annual with a procumbent or rarely erect, branching stem of 7-15 cm.; lower and radical leaves petiolate, obovate-spatulate or cuneate, upper oblong or entire; flower-stalk short; involueral bracts ovate-lanceolate or oblong, hispid and almost muricate; ray florets few and very small, the ligules scarcely exceeding the pappus; disk florets numerous, small and all fertile; fruiting head 6-8 mm.; achenes quite similar in the ray and in the disk, flattened with thick obtuse margins, slightly hispid; pappus of about 4-6 rigid, divaricate, more or less barbed unequal bristles, alternating with as many much shorter bristles or scales, either subulate and entire or palmate, 3-fid or sometimes spatulate, and all hispid. Benth. *Fl. Austral.* iii. 506.

First found in Tweedside by I. M. H. and J. Fraser in 1908. See *Tr. Bot. Soc. Edin.* 41, 1909. Named at Kew, and by Dr Thellung. On river shingle between Galafoot, Selk., and Melrose,



Fig. 21.

CALOTIS HISPIDULA F. v. Mueller, var. *SESSILICEPS* Thellung.

and at the junction of Elwyn and Tweed, thence on to Newstead, Roxb. Very plentiful in the sunny year of 1908, looking at a distance like moss, covering as it did completely with its rich olive-green the cold gray colour of the shingle in which it grew. Flowering June to September. Also seen in 1909 and 1910. These years were bad, as the want of early sunshine and the heavy floods prevented the plants from maturing. It has appeared up to 1917. Exhibited at the Linnean Society April 2, 1914.

The illustration shows a mass of achenes entangled in wool.

Var. *SESSILICEPS* Thellung in *Rep. B. E. C.* 15, (1914) 1915. Capitulis ad caulis nodos plane sessilibus, thus Dr Thellung characterises the variety, new to science, which was gathered by I. M. H. on Tweedside, Selk., in August 1913. Found in the same localities as the type. Fig. 21.

Regarding this variety Mr Maiden, of the Sydney Herbarium, to whom it was submitted, writes:—"I cannot quite match your specimen with any Australian specimen."

The bristly fruits of both *C. hispidula* and the var. *sessiliceps* readily adhere and become entangled in the wool, with the result that they are often present in great quantities (especially in Sydney wools) so that portions of the staple are quite matted with them.

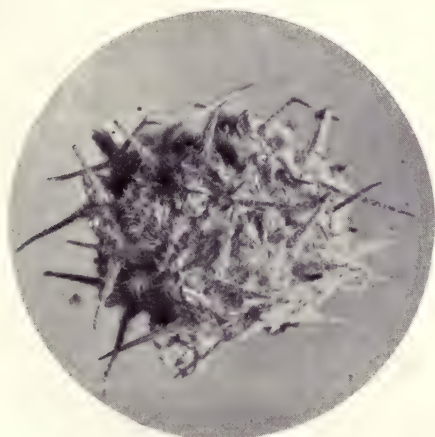


Fig. 22.

CALOTIS HISPIDULA F. v. Mueller.

282 (5) **AMELLUS** L. Syst. ed. x. 1225, 1759, not of O. Kuntze.

A South African genus of about a dozen [9 D. T.] suffruticose or herbaceous species with the lower leaves opposite, upper alternate,

oblong, entire (or a few toothed), strigillose or canescent; flower-heads terminal, solitary; ray flowers blue; disk yellow. *Amellus* was used by Virgil to designate a beautiful flower which by some authors is suggested to be *Aster Amellus* L.

1248 (10) *A. strigosus* (Thunberg) Less. in *Linnaea* vi. 110, 1831.
A. annuus Willd. ex Ind. Kew.

South Africa—Groenekloof, Gauritz River, Bosjis Veld, Sneeweberg, &c.

A diffuse or often nearly prostrate annual, rough with spreading hairs; leaves mostly alternate, roughly pubescent, linear-lanceolate or spatulate; paleae acuminate.

First found in Britain on banks of the Tweed, $1\frac{1}{4}$ miles below Gala-shiels, Selk., I. M. H., August 1914. See *Rep. B. E. C.* 199, (1915) 1916. Flowering August to September. Det. A. Thellung.

Var. **THUNBERGII** Harvey in Harvey & Sonder *Fl. Cap.* iii. 63, 1854-55, differs from the type in having leaves mostly entire, sometimes denticulate, not lobed.

283 (3) **CHRYSOCOMA** L.

A genus of nearly [50 8 D.] T. species, chiefly natives of Brazil, South America and South Africa, one species being found in Siberia and another in the Caspian area. Heads many-flowered, homogamous; receptacle naked, somewhat honeycombed; involucre campanulate, shorter than flowers, imbricate, of oblong-lanceolate scales; achenes laterally flattened, beakless, hispidulous; pappus in one row of slender, rough bristles; heads globose, yellow—hence the name from *chrysos*, gold, and *coma*, plume.

1259 (3) *C. Coma-aurea* L.

C. aurea Thunberg. *C. cernua* L. Fig. 23.

South Africa—western districts of Cape Colony.

A small, much branched, shrubby plant, 3-5 dm., glabrous or nearly so; leaves scattered, linear, flat, subacute, quite entire, spreading or recurved; heads shortly stalked in clusters of 120-150 golden flowers.

First found in Britain, I. M. H., September 1914. See *Rep. B. E. C.* 199, (1915) 1916. Found growing robustly among herbage by the Tweed, $1\frac{1}{2}$ miles below Galashiels, Selk. Flowering August to September. Det. A. Thellung.

283 (4) *FELICIA* Cass. in *Bull. Soc. Philom.* 165, 1818.

An African genus of about 14 species [10 D. T. and Dur.; omitted by Uphof] merged into *Aster* by Harvey. It was named *Detris* by Adanson (*Fam. des Plantes* ii. 131, 1763) and described first as *Agatacha* by Cassini in *Bull. Soc. Philom.* 175, 1815. The name was



Fig. 23.

CHRYSOCOMA COMA-AUREA L.

again changed by him to *Agathaea* (Dict. Nat. Sc. Suppl. 77, t. 89, 1816). He also gave the generic names of *Munychia*, 1825, and *Polyrharrhena*, 1828, to plants now included in *Felicia*. *Felicia*, so named from *felix*, happy, on account of the bright appearance of the flowers, contains a few annual but mostly suffruticose species, mainly from South Africa, but two are found as far north as Abyssinia. Leaves alternate, entire or toothed; flower-heads radiate; ray florets blue or white, those of the disk yellow; involucre hemispheric or broadly campanulate, with two to several series of narrow, imbricated, scarious-edged bracts.

1259 (10) F. tenella Nees Gen. & Sp. Aster. 208, 1833.

F. fragilis Cass. in Dict. Sc. Nat. xvi. 315. *Aster tenellus* L. Pl. Rar. Afr. 21, 1760. *Cineraria tenella* Link Enum. Hort. Berol. ii. 334, 1822. *Detris tenella* (L.). Curtis Bot. Mag. t. 33, 1787. Fig. 24.

South Africa—throughout the western districts of Cape Colony.

A variable annual or biennial, 5-30 cm. high; leaves narrowly linear, nerveless, mostly rigidly ciliate, 6 mm. to 5 cm. long; achenes more or less pubescent or hispidulous; branches 1-headed; pubescence hairy, glandular or viscidulous.

First found in Britain, in Selk., I. M. H., August 1913. See *Rep. B.E.C.* 326, (1913) 1914. Found on shingle near the mouth of the Gala. Flowering August to September. Det. A. Thellung.

284 ERIGERON L.

A large genus of about 170 [110 Dur.] species, scattered over the temperate regions of the world, allied to *Aster*, but having the ray florets in several series. As a rule, too, they are conspicuous. The Greek word, *eriogron*, means old in spring, and was the name given by Theophrastus to a composite plant. The alpine species grow at great altitudes.

1262 E. canadense L. *Canadian Flea-bane, Horseweed* (U.S.A.).

Leptilon canadense Britton. Syme E. B. v. t. 773.

Throughout North America and widely adventive in Europe. It is mentioned by Brunyer in 1653 in the *Catalogue of the Garden of Blois*, and De Candolle says Boccone found it naturalised in the Midi in 1674. Mesopotamia, Assyria, Armenia, Taurus, Punjab up to 1000 metres; China; abundant throughout New Zealand; at Port Jackson, New South Wales; adventitious in Chile, and has recently been found in Egypt; Natal.

A stiff, erect annual, 3-6 dm., nearly glabrous; leaves narrow, entire or slightly toothed; flower-heads very numerous, small, in a small leafy panicle; florets minute, the outer filiform, about as long as the involucre, whitish or flesh-coloured, the inner tubular, yellowish-white; pappus in one row; the leaf margins ciliated with short incurved hairs arising from a small tubercle.



Fig. 24.
FELICIA TENELLA Nees.

Found on a recently made embankment by the side of the Tweed, two miles below Galashiels, Roxb., I. M. H., August 1910. Flowering August to November.

E. acre L. also occurs by the Tweed, and may be of wool origin.

1262 (2) *E. bonariense* L. Sp. Pl. 863, 1753.

E. crispus Pourr. Chlor. Narb. n. 470 in Mém. Acad. Toulouse iii. 318, 1778. *E. linifolius* Willd. Sp. Pl. iii. 1955, 1804.

Conyza ambigua DC. Reichb. Ic. xvi. t. 915. Figs. 25 and 26.

Common in the tropics and sub-tropics of the Old and New World. Ceylon (!), China, Hong Kong (!) roadsides, Shanghai (!), Florida, Bermuda, Paraguay, Japan—Nagasaki (!), Canaries, Cape Verde, Egypt, Cairo, the Great Oasis, Suez, Australasia : Queensland—a troublesome weed, New South Wales—Melbourne(!), South Australia—Adelaide(!), West Australia, New Zealand—North and South Islands, abundant in the Auckland district. Adventive in France about 1700. Completely naturalised in Dalmatia—Ragusa (!), Greece and Syria.



Fig. 25.

ERIGERON BONARIENSE L.



Fig. 26.

ERIGERON BONARIENSE L.

A coarse annual, 3-9 dm., hirsute, and also with minute appressed hairs; lower leaves stalked, oblong, often coarsely toothed, pinnatifid; stem leaves sessile, entire or remotely toothed, narrowed downwards; flower-heads rather small, stalked, more or less paniculate; involucre cinereous-pubescent, broadly ovoid or almost hemispherical; phyllaries narrow, acute, in 2 or 3 series; female flowers very numerous, filiform, shorter than pappus, outer ones usually dilated at tip into a minute ligule, the others all tubular; disk florets few; pappus in two rows. The beautiful photographs show the mature flower-heads and the pappus-bearing fruit.

First found in Britain at Galashiels, I. M. H., September 1909. See *E. linifolius* in *Rep. B.E.C.* 415, (1909) 1910; also J. Fraser in *Ann. Scot. Nat. Hist.* 45, 1910. Found plentifully during successive years in the vicinity of Galashiels Skin-works; along the banks of the Gala to its junction with the Tweed, Selk., and at places on that river for a distance of six miles, Roxb. Flowering August to November. Exhibited at the Linnean Society December 1, 1910. Named at Kew.

288 STUARTINA Sonder in Linnaea xxv. 521, 1852.

A monotypic Australasian genus differing from *Gnaphalium*, of which it has the habit, in the absence of the pappus. The involucre is ovoid; the bracts imbricate, appressed, without appendages, or the inner ones with recurved horn-like tips; receptacle without scales; florets few, those of the circumference female, filiform, those of the disk very few, hermaphrodite, 4 or 5-toothed; anthers with small, fine tails; style branches terete, truncate; achenes obovoid-oblong.

1272 S. Muelleri Sonder in Linnaea, l.c.

Australasia: Victoria—Barossa Range, Jellong; South Australia—Mount Lofty Range(!), Onkaparinga, Cudnaka (*Sonder*); New Zealand—adventive in the South Island on sandy places near the mouth of the Awatere River.

A small, diffuse or slender annual, rarely 6 inches high; leaves on long petioles, nearly orbicular, about $\frac{1}{4}$ inch diameter, woolly-tomentose or at length glabrous above; flower-heads very small, in little globular clusters, sessile amongst the floral leaves, similar to those of the stem, the petioles much longer than the clusters; involucre narrow, scarcely 1 line long, surrounded by a tuft of long woolly hairs, the bracts appressed, but after flowering one to three of the inner ones are usually produced into recurved horns; florets from 5-7, of which one or two in the centre are hermaphrodite; achenes glabrous or papillose. Benth. *Fl. Austral.* iii. 657.

First found at Galashiels, I. M. H., August 1913. Found on the pebbly margin of the Gala within the township of Galashiels and near the mouth of that stream, Selk. Flowering August to October.

289 GNAPHALIUM (Vaillant) L.

A large genus of about 200 species [120 D. T., 100 Dur.], world-spread, including some cosmopolitan species. The name is derived from *gnaphalon*, soft down, with which so many of the herbaceous or suffrutescent species are covered. Leaves alternate, entire; inflorescence of clustered (rarely solitary) cymose flower-heads; florets yellow, white or rarely reddish, the involucrel conspicuously scarious, hence the common name "Everlasting;" anther-base finely tailed.

1273 G. luteo-album L.

Syme E. B. v. t. 742.

An almost cosmopolitan weed except in Arctic regions, long known in the Channel Isles, where it was noticed in Jersey by Sherard before 1690. There is a specimen in *Herb. Dillen*. It is also found in wild-looking situations in the eastern counties, but usually adventive. Found throughout Europe except in the north; Caucasus to Egypt, Persia, Arabia, Turcomania, Beluchistan, throughout India—ascending in Kashmir to 3200 metres, Burma, Cape Colony (!), Natal frequent—Durban (!), Canaries, Madeira, St Helena, Brazil, Australasia; New Zealand—abundant in both islands and in the surrounding islands up to 1000 metres, and as a var. *multiceps* in India, China—Kukiang (!), etc.

Herbaceous, 2-7 dm., with spathulate, obtuse, sessile or amplexicaul leaves, which are usually downy on both sides, entire or very slightly crenulate; involucrel scales in few series, straw-coloured; fruits papillose, not hairy; flower-heads about 4 mm. long, in leafless clusters, arranged in a terminal corymb, exceeding the leaves at their base. Doubtless it is from Australasian or Cape wool that the plant has come into Tweedside.

First record for Selk., J. Fraser and I. M. H., September 1908. See *Tr. Bot. Soc. Edin.* 42, 1909. Found along the banks of the Gala below Galashiels, Selk., and by I. M. H. by the side of the Tweed between that town and Melrose, Roxb. Flowering August to September. Det. A. Thellung.

1278 G. undulatum L.

Dill. Hort. Eltham. t. 108, f. 130.

South Africa—Cape, Natal. Adventive in W. France and Jersey.

A somewhat viscid, tall, herbaceous species, branched above, with cobwebbed stem and oblong, lanceolate, wavy, somewhat viscid leaves, green above, but cottony beneath, decurrent, thus differing from all or nearly all of the Cape species; heads of 30-40 flowers arranged in a corymbose panicle; involucrel scales glabrous, pale yellowish, oblong, obtuse or subacute.

First found in Scotland, I. M. H., October 1911. On the banks of the Gala below Galashiels, Selk., also among herbage on an embankment by the Tweed about a mile further on, Roxb.

Strong plants, profusely flowered. Flowering September to October.

1278 (2) *G. purpureum* L.

Widely spread in North America from Maine to Florida, west to Pennsylvania, Kentucky, Arkansas, Texas, Mexico, and on the Pacific Coast and in South America—Chile, etc. Adventive in the Gangetic Plain, Hong Kong, Australia—Queensland, common about Sydney, and in cultivated places at Port Jackson, New South Wales; New Zealand—North and South Islands, in freshly cleared land-drained swamps.



Fig. 27.

GNAPHALIUM JAPONICUM Thunberg.

Ascending or erect, 15-30 cm.; leaves mostly stalked, spathulate, upper rarely linear, cottony white on both sides as is the stem; flower-heads in short dense clusters in the axils of the upper leaves or forming a terminal spike; involucre dirty white or pale brown.

First found in Britain, I. M. H., September 1913. See *Rep. B.E.C.* 326, (1913) 1914. On an islet in the Gala within the burgh of Galashiels, and near the mouth of that stream, Selk. Flowering September to October.

1278 (3) *G. japonicum* Thunberg Fl. Jap. 311, 1784.

G. involucreatum Forster f. *Fl. Ins. Austr. Prod.* 55, 1786. *Bot. Mag. t.* 2582. *Fig.* 27.

A widely-spread species: Australia—Queensland, New South Wales, Victoria, Tasmania, South Australia—near Adelaide(!), West Australia; abundant throughout New Zealand to 800 metres, China, Korea(!), Malay Archipelago.

Annual, erect, 2-7 dm.; stem often woody at base, branched, more or less white and cottony; leaves scattered, 2-10 cm. long, oblong-spathulate to linear-lanceolate, acute, nearly glabrous above; heads small, compacted into a dense cluster, with linear bracts at the base; involucre bracts scarious, brown or straw coloured, erect, without spreading tips; pappus-bristles very fine, scarcely cohering at base.

First found in Britain, I. M. H., September 1913. See *Rep. B.E.C.* 326, (1913) 1914. On the banks of the Gala close to Galashiels, Selk., also by the side of the Tweed about 2 miles further on, Roxb. Flowering September to October. Exhibited at the Linnean Society April 2, 1914. Named at Kew.

1278 (4) *G. parvulum* Harvey Fl. Cap. iii. 262.

South Africa.

Annual, 7-14 cm., slender, erect or diffuse, branching, white-woolly; branches thread-like, flexuous; leaves scattered, obovate, tapering much at base, acute or mucronate; heads tufted at the ends of the branches, or subsessile or pedicelled in the upper axils; involucre cylindrical, few-flowered, woolly at base, the inner scales oblong, very obtuse, hyaline, glabrous; female flowers 15-16, perfect flowers 2-3. *Fl. Capensis, l.c.*

First found in Britain, I. M. H., Galashiels, Selk., August 1913. See *Rep. B.E.C.* 200, (1915) 1916. Found on the shingle near the mouth of the Gala. Of rare occurrence. Flowering August to September. Determined, with some reserve, by A. Thellung, and named "near *Wilmsii*" by Spencer Moore.

289 (2) HELIPTERUM DC. Prod. vi. 211, 1837.

A genus of about 50 species, first added to the British List by I. M. H. from Tweedside. It contains some beautiful species found



Fig. 28.

HELIPTERUM CORYMBIFLORUM Schlecht.

chiefly in South Africa and Australia, where they are endemic. It is closely allied to *Helichrysum*, from which it differs only in the hairs of the pappus being feathery or plumose instead of pilose. The name (derived from *helios*, the sun, and *pteron*, a wing) alludes to the feathery pappus. The plants of this genus are annual or perennial, or rarely slender divaricate shrubs with leafy stems, clothed with cottony wool or nearly glabrous; florets yellow; the lamina of the involueral bracts usually white, yellow, brown or pink, often varying in all these colours with intermediate shades in the same species.

1278 (5) *H. corymbiflorum* Schlecht. in *Linnaea* xxi. 448, 1848.
Fig. 28.

Australasia: New South Wales—Lachlan, Darling and Murray Rivers; Victoria—Avoca River; South Australia—Fiedler's Section, near Gawler Town, Holdfast Bay.

An erect, woolly, white, corymbose annual of $\frac{1}{2}$ to 1 foot; leaves linear or lanceolate, mostly obtuse, soft, the upper ones few and small; flower-heads, in the original form, in a rather loose, terminal, leafless corymb, with a few small scarious bracts on the branches and peduncles; involucre turbinate, about 3 lines long without the ray, the outer bracts wholly scarious, broad, obtuse, slightly woolly-ciliate, the inner with linear or cuneate claws, woolly towards the top with radiating petal-like white laminae, about $2\frac{1}{2}$ lines long; florets all hermaphrodite, but some of the central ones usually sterile; achenes densely silky-villous; pappus of about 15 to 20 plumose bristles. Sonder in *Linnaea* xxv. 519.

First found in Britain by the Tweed at Galashiels, I. M. H., August 1908, and exhibited at the Botanical Society of Edinburgh November 12, 1908. See *Ann. Scot. Nat. Hist.* 42, 1909, and *Rep. B.E.C.* 349, (1908) 1909. Found very rarely on the marshy margin of the Gala a mile below Galashiels, Selk. Flowering in August. Det. E. Gilbert Baker at the Natural History Museum, South Kensington.

1278 (6) *H. glutinosum* (Steetz) Druce in *Rep. B.E.C. Suppl.* 627, (1916) 1917.

H. Hyalospermum F. v. Mueller ex Benth. *Fl. Austral.* iii. 644, 1866. *Hyalospermum glutinosum* Steetz in *Lehm. Fl. Preiss.* i. 476, 1845. Figs. 29 and 30.

Australasia—New South Wales, Victoria, South Australia, West Australia.

A slender, erect, glabrous or slightly woolly annual, rarely much above 6 inches high, and often smaller; leaves narrow linear, almost filiform; flower-heads on long peduncles, leafless, except a few small scarious scales, passing into the outer involueral bracts; involucre hemispherical when fully out, 4 to 5 lines diameter without the ray, the outer bracts short, sessile, brown or yellow, with a more rigid lanceolate centre, the inner with a broad

scarious brown claw and yellow petal-like radiating lamina about 2 lines long; receptacle flat; florets rather numerous, all hermaphrodite; achenes glabrous or papillose, rather more compressed than in most *Heliptera*; pappus-bristles 8 to 12, equally plumose, but yellow at the tips. Benth. *Fl. Austral.*, l.c., under *H. Hyalospermum*.

First found in Britain, I. M. H., August 1908 (*Rep. B.E.C.* 349, (1908) 1909), at Galashiels, near the junction of the Gala and Tweed, Selk. See *Ann. Scot. Nat. Hist.* 101, 1911. Exhibited



Fig. 29.

HELIPTERUM GLUTINOSUM (Steetz) Druce.

at the Linnean Society December 1, 1910. Flowering August to September. Named at Kew, November 1909.

The photograph shows the pappus-bearing fruit.



Fig. 30.

HELIPTERUM GLUTINOSUM (Steetz) Druce.

1278 (7) *H. pygmaeum* (Türcz.) Druce.

H. dimorpholepis Benth. Fl. Austral. iii. 650, 1866. *Dimorpholepis australis* A. Gray in Hook. Kew Journ. iv. 227, 1852. Hook. Ic. Pl. t. 856. *Triptilodiscus pygmaeus* Türcz. in Bull. Soc. Nat. Mosc. 24, ii. 66, 1851.

Australasia: New South Wales—Port Jackson, Blue Mountains, Nangas, New England; Victoria—Murray River, Firy Creek, etc.; South Australia—Rocky Creek; West Australia.

An annual with erect or ascending, branching stems, green, with a few long hairs, but scarcely any wool, 3 to 6 inches; leaves linear, rather broad, $\frac{1}{2}$ to 1 inch long; flower-heads small, broadly ovoid, sessile within a few floral leaves, exceeding the head, terminal or sometimes lateral; involucre broadly ovoid, above 2 lines long, the outer bracts lanceolate, scarious, fringed with long cilia, the inner with rigid, glandular claws and small scarious tips, not spreading; receptacle conical; florets rather numerous, exceeding the involucre, a few of the outer ones female; achenes glabrous; pappus of about 3 or 4 plumose-ciliate bristles, more or less flattened and scale-like, the outer achenes, especially those of the female florets, often without any pappus, and the innermost usually abortive. Benth. *Fl. Austral.*, l.c.

First found in Britain, I. M. H., Galashiels, August 1913, and recorded in *Rep. B.E.C.* 15, (1914) 1915, as *H. dimorpholepis*

Benth. On shingle by the side of the Tweed fully a mile below Galashiels, Selk. Flowering August to September. Exhibited at the Linnean Society April 2, 1914. Named at Kew.

1278 (9) *H. floribundum* DC. Prod. vi. 217, 1837.

H. chionolepis F. v. Muell. Fig. 31.

Australasia: New South Wales—Molle's Plain, Darling and Lachlan Rivers, between Stokes Range and Coopers Creek; South Australia; Flinders Range, Cudnaka, Wills Creek, Mount Searl.

Stems erect and nearly simple when flowering the first year, at length diffuse, much branched and woody at the base, the branches ascending from a few inches to above 1 foot high, glabrous or loosely woolly. Leaves linear or rarely linear-lanceolate, acute; flower-heads solitary on each branch, but the upper branches often numerous and paniculate; involucre hemispherical, rather smaller than in *H. anthemoides*, the bracts all white and petal-like, the outer ones short and sessile, passing into the inner ones, with a scarious claw and radiating lanceolate lamina of 3 lines or more, receptacle hemispherical or conical; florets all hermaphrodite; achenes densely silky-villous; pappus of 7-10 rigid, equally plumose bristles. Benth. *Fl. Austral.* iii. 642.

First found in Britain at the mouth of the Gala, Selk., I. M. H., July 1910. See *Rep. B.E.C.* 504, (1910) 1911. Of frequent occurrence, growing amongst herbage. Flowering July to September. Exhibited at the Linnean Society December 1, 1910. Named at the Natural History Museum, South Kensington.

289 (3) *HELICHRYSUM* (Vaillant) Miller Gard. Dict.

Abr. ed. 4, 1754.

A large genus of nearly 300 species spread over Europe, Asia, Africa, Australia, but most largely represented at the Cape, consisting of herbaceous or shrubby plants with large solitary flower-heads, the involucre bracts conspicuously scarious (not silvery), spreading or recurved. Sometimes the flower-heads are small and clustered, with incurved bracts, but the pappus is always rough or only sub-plumose, not feathery as in *Helipterum*. The flowers are often very brilliant yellow, and the laminae of the involucre bracts are often white, yellow, brown or pink. To these coloured scarious bracts, which remain unwithered, the common name "Everlasting" is due. The name is derived from *helios*, the sun, and *chrysos*, golden. From *Gnaphalium* the genus differs in having the female florets less numerous than the bisexual ones. Tournefort delineated it under the name of *Elichrysum*.

1278 (11) *H. apiculatum* D. Don in Mem. Wern. Soc. v. 550, 1824.

Gnaphalium apiculatum La Bill. Fl. Nov. Holl. ii. 43, t. 188, 1805.

Chrysocephalum apiculatum Steetz. Bot. Reg. t. 240, 1817.



Fig. 31.

HELIPTERUM FLORIBUNDUM DC.

Australasia: North Australia, Queensland, New South Wales, Victoria—throughout the colony; Tasmania—abundant throughout the island; South and West Australia.

Annual (?) or perennial, usually woody at base, branching, with several erect stems, 3-7 dm. high, clothed with a silvery tomentum; leaves stalked, the upper lanceolate or linear, flat and cottony; flower-heads in more or less dense, terminal corymbs; involucre broadly turbinate or nearly globose, about 12 mm. diameter, the bracts in many rows, of a bright golden colour, but varying into brown, red, straw-coloured or pure white or pink, scarcely squarrose; pappus of the disk of 4-10 fine bristles, strongly barbellate or plumose towards the end. Bentham (*Fl. Austral.* iii. 615) puts this into the section *Chrysocephalum*, one of the 5 sections under which he arranges the 52 Australian species.

First found in Britain, I. M. H., Galashiels, Selk., August 1913. See *Rep. B.E.C.* 326, (1913) 1914. Flowering August to September. Named at the Edinburgh Royal Botanic Gardens.

1278 (12) *H. odoratissimum* (L.) Less. Syn. Compos. 301.

Gnaphalium odoratissimum L. *G. strigosum* Thunberg. Fig. 32.

South Africa—common throughout the colony.

Stem suffruticose at base, 2-5 dm., erect or spreading, much branched; branches tomentose; leaves long, decurrent, spathulate, white-woolly; cymes more or less stalked, densely branched; heads subsessile, 10-12 flowered; involucre scales erect, glabrous, oblong, obtuse, the outer shorter and fulvous, the inner yellow. This belongs to one of the 137 species described in the *Flora Capensis*, where it is put in the section *Decurrentia*, characterised by the strongly decurrent leaves which are woolly on both sides.

First found in Britain, I. M. H., September 1914. See *Rep. B.E.C.* 200, (1915) 1916. Near the mouth of the Gala and along the side of the Tweed between Galashiels and Melrose, Selk. and Roxb. Flowering August to September. Det. A. Thellung.

289 (4) *MILLOTIA* Cass. in Ann. Sc. Nat. i. xvii. 416, 1829.

A very small genus of three Australasian plants allied to *Leptorhynchus* and *Waitzia*, from which it differs in the involucre, and from other genera of the Gnaphalieae in the slender beak of the achenes. It consists of small annuals, having linear, alternate leaves; flower-heads very small, on terminal stalks; involucre cylindric or almost ovoid, of few, nearly equal, narrow bracts; receptacles small, without scales; florets all hermaphrodite, 4 or 5 toothed; anthers with fine, usually ciliate-plumose tails. . . pappus of fine, barbellate or ciliate, capillary bristles. Benth. *Fl. Austral.* iii. 596.

1278 (26) *M. depauperata* Stapf in Kew Bulletin 22, 1910.

Presumably of Australasian origin, but as yet it has not been found in its native country.



Fig. 32.

HELICHRYSUM ODORATISSIMUM (L.) Less.

A ceteris speciebus hujus generis involucri phyllis tantum 4-5 latiusculis obtusis apiculatis et achenii rostro longo compresso ad angulos papilloso pubescente distincta. Annua; specimen unicum visum 6 cm. altum, a basi ramosum. Folia plus minusve congesta, linearia, acuta, basin versus attenuata, ad 3 cm. longa, 1 mm. lata, juniora plus minusve lanata, deinde glabrata. Capitula solitaria, pedunculo primo superne lanato ad 3 cm. longo suffulta, ad 6 mm. longa, ad 5 mm. diametro, turbinata. Involucri phylla 4-5, oblonga, obtusissima, minute tenuiterque mucronulata, ad 1.6 mm. lata, latissime scariosa, in vitta viridi media primo parce lanata. Flores 12-20, omnes hermaphroditi, receptaculo epaleaceo plano inserti, centrales steriles ut videtur. Corolla anguste tubulosa, superne subcampanulato-ampliata, aurea, 2 mm. longa, 4-5 dentata. Antherae lobi basi tenuissime lanato-caudati. Stigmata apiculata, infra apiculum circumcirca papillosa. Achenium (sub anthesi) lineare, 1 mm. longum, papillosum, in rostrum compressum latiusculum aequilongum ad angulos dense papilloso-ciliatum productum.

First found in flower on the shingle near the mouth of the Gala, Selk., I. M. H., and J. Fraser, August 1908. Not since observed. New to science.

1278 (27) *M. tenuifolia* Cass. in Diet. Sc. Nat., l.c., and in DC. Prod. vi. 161.

Australasia: New South Wales—Malee scrub (*Vict. Exped.*); Victoria—about Melbourne, Glenelg River and in the Grampians, etc.; Tasmania—common in dry stony places; South Australia—from the Murray to St Vincent's and Spencer's Gulf; West Australia—King George Sound, thence to Swan River, Murchison River, and eastwards to the Great Bight.

A slender, erect annual of 2 to 6 inches or rather more, simple or branched, hoary or white with close or woolly hairs or becoming almost glabrous; leaves narrow-linear, or the lower ones broader and contracted into a long petiole; involucre varying from under 3 to above 4 lines in length; the bracts linear, herbaceous, hoary, with minute coloured tips; florets 20 to 30, longer than the involucre; achenes papillose or almost muricate, the slender beak very variable in length; the pappus of very shortly barbellate, capillary bristles. Benth. *Fl. Austral.*, l.c.

First found in Britain, I. M. H., Galashiels, October 4, 1911. See *Rep. B.E.C.* 21, (1911) 1912. See also *Ann. Scot. Nat. Hist.* 106, 1911. On the banks of the Gala a short distance below Galashiels, Selk. Specimens were so small as to be practically invisible among herbage and difficult of detection on shingle. Flowering August to October. Exhibited at the Linnean Society April 2, 1914. Named at Kew.

289 (5) TOXANTHES Türcz. in Bull. Soc. Mosc. xxiv. i.
176, 1851.

Anthocerastes Asa Gray. *Toxanthus* Benth.

A small genus of two Australasian species. Involucre cylindrical of very few, narrow, herbaceous, nearly equal bracts; receptacle small, without scales; florets few, hermaphrodite; corolla tubular, 4 or 5 toothed, continuous with the ovary, persistent and recurved; anthers with short fine tails; style branches with lanceolate, papillose tips; achenes cylindrical, tapering at the top, without any pappus. The name comes from *toxon*, a cow. Benth. *Fl. Austral.* iii. 592.

1278 (28) T. Muelleri Benth. *Fl. Austral.* iii. 592, 186. Fig. 33.
South Australia—by the Murray River.

A diffuse annual (named after Baron Ferdinand von Mueller, the distinguished Melbourne botanist) of $\frac{1}{2}$ to 1 inch, slightly glandular-pubescent; leaves linear; flower-heads small, terminal; involucre about $1\frac{1}{2}$ lines long, of 4 or 5 bracts, linear-lanceolate,

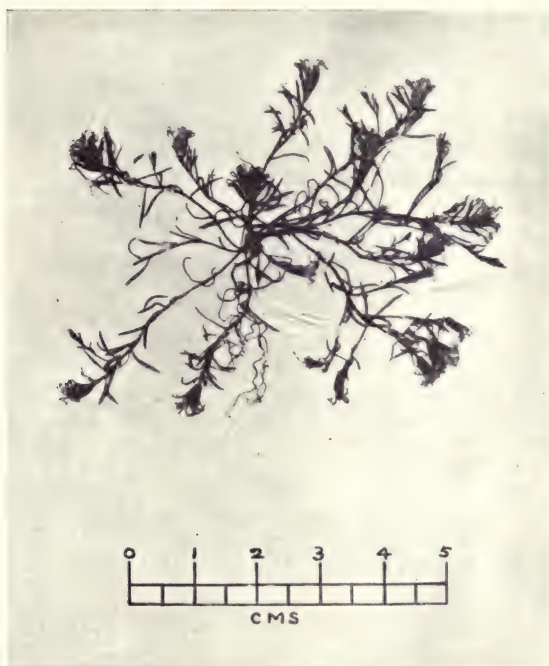


Fig. 33.

TOXANTHES MUELLERI Benth.

with slightly scarious margins; florets 5 to 10, very slender, 4 or 5-toothed; achenes terete, shortly hirsute, not distinctly beaked, but shortly tapering at the top and continuous with the recurved corolla, which is persistent but sometimes at length deciduous. Benth., *l.c.*

First found in Britain, I. M. H., September 1913. See *Rep. B.E.C.* 15, (1914) 1915. On the shingle by the side of the Tweed a little distance beyond its junction with the Gala, Selk. Flowering August to October. Exhibited at the Linnean Society April 2, 1914. Det. A. Thellung.

290 INULA L.

A large genus of about 100 [90 D. T., 56 B. & H.] species, chiefly represented in the temperate regions of the Old World, a few extending into the tropics, some reaching to the Himalayas and Japan, one to South America, and another to San Domingo. It consists of herbaceous or frutescent species, mostly yellow-flowered, the rays rarely white; involucre imbricated in many series, the scales spreading at the point; receptacle flat, naked; ray florets numerous, ligulate, linear; disk florets very numerous, tubular.

1284 (2) *I. graveolens* (L.) Desf. Fl. Atlant. ii. 275. Fl. Graeca t. 866.

Erigeron graveolens L. *Cupularia graveolens* Gren. & Godr.
Fig. 34.

In sandy and stiff soils and calcareous rocky ground in Spain, France, Italy, S. Austria, Adriatic coast, Serbia, Greece, Turkey, Malta, Syria, Peshawar, Tunis, Algeria. Adventitious in Australia and becoming a pest, known as Stink-weed; abundant about Adelaide in South Australia (*G. C. D.*).

An annual, glandular plant with a disagreeable odour, about 2-7 dm. high, entirely herbaceous; leaves entire, linear-oblong, obtuse, longly attenuate at base; cauline leaves linear, sessile, pointed, spreading or reflexed; heads small, stalked, forming a lax pyramidal panicle; phyllaries herbaceous; ligules very short, yellow or tinged with violet; fruits hairy.

First found in Britain, I. M. H., September 1913. See *Rep. B.E.C.* 200, (1915) 1916. Abundant in the vicinity of Galashiels Skin-works; then along the banks of the Gala, Selk., also at various spots by the Tweed for nine miles to Dryburgh, Roxb. Flowering August to October, but sensitive to frost. Det. A. Thellung.

291 PULICARIA Gaertn. Fruct. ii. 461, 1791.

A genus of about 50 species [24 B. & H., 30 D. T.], chiefly European and Asiatic, with a few African. The name is derived from *pulex*, a flea, in reference to their insecticidal properties. It is closely allied to *Inula*, with which Linnaeus united it, but it differs in the pappus having an outer row of short scales.



Fig. 34.

INULA GRAVEOLENS (L.) Desf.

1286 (2) *P. arabica* Cass. in Dict. Sc. Nat. xliv. 94, 1825.

Inula arabica L. Mant. 114.

Orient—Smyrna, Syria, Mesopotamia, Armenia, Persia, Egypt, Sahara. Boissier records it from Rhodes.

Annual, stem 3-5 dm.; stalk hairy, often lanate, dichotomously branched from below the middle; leaves oblong, mucronate, denticulate, flat, narrowed into the stalk, villose or hairy, those of the branches semi-auriculate; inflorescence rigid; involucre scales hairy, linear-lanceolate, acuminate; ligules patent, longer than disk; pappus with 10 bristles, barbellate towards the tip, three times longer than achene. Differs from *P. prostrata* in the more slender and dichotomous branching, and the much longer pappus. The Scottish plant is less hairy than the Asian. Det. I. M. H.; confirmed G. C. D.

First found in Britain, I. M. H., September 1913, on the banks of the Gala half a mile below Galashiels, Selk. Flowering in that month.

297 XANTHIUM (Tourn.) L.

A small, unattractive genus armed with prickly fruits which have enabled two species to follow the trade routes of the world so that their native home is conjectural. It consists of 5 or 6 [3 or 4 D. T.] annuals, scabrid, hoary or glabrate, with alternate, stalked, palmately-lobed or sinuate leaves with unisexual, monoecious flower-heads, the staminate globose, in terminal clusters, the pistillate 2-flowered, the receptacle scaly. The name, used by Dioscorides, signifies yellow, a dye of that colour being used by the Greeks to stain the hair.

1295 *X. spinosum* L.

Bathurst Burr (Australia);

Cepacaballo (Chile); *Spring Clotbur* (U.S.A.).

Britton & Br. Ill. Fl. N. U.S., etc., iii. 297, f. 3598. Bailey & Gordon's Poisonous Plants, t. 33. Benth. Fl. Austral. iii. 535.

Cosmopolitan, but probably of S. American origin (see Thell. *Fl. Adv. Montp.* 505 and Ascherson in *Verh. Prov. Brand.* xvii. 11, 1875). Godron thought it was of N. African origin. Scattered throughout Europe in the vicinity of rubbish, by stream-sides where wool-washing is carried on, etc., in Arabia, Syria, Egypt, Natal, Taurus, Caucasus. Adventive in North America from Ontario to Florida, west to Illinois, N. Virginia, Texas, Missouri, California, and introduced to Chile from that state. Argentina—Buenos Aires; provinces of San Luis and Mendoza, Peru. One of the worst weeds in Australasia (first observed there in 1852) and a great detriment to the wool in the pastures of Queensland, New South Wales, Victoria. In the North Island of New Zealand. At certain stages of its growth it has proved poisonous to cattle. E. F. Layard says:—"Between 1855 and 1860 a ship laden with wool from Australia was wrecked on Cape L'Agulhas,

Cape Colony. Many of the bales were washed up and salvaged, being spread out to dry along the shore and subsequently sold on the spot by auction. Some were bought by a gentleman living at Simons Town, near Cape Town, transported thither, and again spread out on some open land to dry. From these two localities specimens were forwarded to me of a new unknown plant that had sprung up in considerable quantities. Dr Pappe, a well-known botanist, identified it as the Bathurst Burr. From the first-named place it spread all over the country, official reports stating that it almost always appeared along the roadsides, evidently dropped from the fleeces of animals travelling along them. The burrs must have been in the wool laid out to dry on the shore after the shipwreck."

An annual from 4 to 8 dm., with yellow tripartite spines at the base of the leaves, the spines 1-3 cm. long, rigid; leaves whitish, with hoary down beneath, shortly stalked, cuneate at base, oblong-lanceolate, entire or three-lobed, the upper surface dark green except the nerves which are pale yellowish.

First record: Below the Cauld at Melrose, Roxb., 1868, Stuart in *Proc. Berw.* 74, 1869-72. Kelso to Gala, Selk., A. Brotherston, l.c., 137, 1873, and *Rep. Bot. Rec. Club* 78, 1874, and I. M. H. in *Tr. Bot. Soc. Edin.* 42, 1909. Found abundantly at Galashiels Skin-works, and in both counties on the banks of the Gala to its mouth, Selk., and thence in many places by the Tweed for ten miles, Roxb. Growing robustly and in genial summers fruiting. Flowering August to October.

I. M. H. planted 31 seeds under glass in mid-March which had been taken from South American wool. Eleven days later three plants had germinated and at the beginning of June were transplanted to the garden. By the end of August they had attained a considerable size, and on the 1st of November one plant had reached a height of 1.2 m., with a circumference of 9 dm., bearing numerous flowers and 150 fruits which ripened as the plants died during the winter. The fruits of this species are known in the wool trade as "hard heads," and are often present in considerable quantity in Australasian and South American wools, but in manufacturing processes are less troublesome than "burrs," which are the fruits of *Medicago*.

1295 (2) *X. ambrosioides* Hooker & Arnott in Hook. Journ. Bot. iii. 310, 1841.

South America: Chile—Los Caldanes, province of Cordoba; Argentina—Buenos Aires. Rarely adventive in France and Germany.

Spinosum tomentosum-incanum, caule procumbente, foliis bipinnatifidis, segmentis oblongis obtusis, margine revolutis, capituli feminei solitarii aculeis tenuibus setiformibus patentibus apice uncinatis, spina terminali valida recta. This very distinct species has the finely cut foliage of *Ambrosia* and the fruit of *Xanthium*. The

terminal spine of the female capitulum is frequently wanting. Hook. & Arnott, *l.c.*

First found in Britain, I. M. H., Galashiels, Selk., August 1910. See *Rep. B.E.C.* 504, (1910) 1911. Near the mouth of the Gala and by the Tweed a short distance further on; also in 1917 at the Skin-works, Galashiels. The plants were much smaller than *Xanthium spinosum*, and were also much rarer. Flowering August to October.

305 BIDENS (Tourn.) L.

A genus of about 130 species [90 D.T.] occurring in the warm and temperate regions of the Old and New World, consisting of herbs with opposite, entire or pinnately or ternately cut leaves, the ligulate flowers when present white or yellow, the pericarp with 2-4 rigid awns which are rough with minute deflexed points, these awns giving the generic name from *bi*, two, and *dens*, a tooth, according to Cesalpini.

1311 (2) *Bidens pilosa* L.

B. leucantha Willd. Sp. Pl. iii. 1719, 1800. Fig. 35.

Probably of South American origin, but now spread over most hot countries. It occurs in all the cultivated tracts of Chile, Brazil, Venezuela; is abundant in the West Indian Islands—Jamaica, Antigua, Grenada, St Vincent, Trinidad, Cuba; Mexico, Texas, Madeira, Canaries, Azores, tropical Africa, Natal, tropical Australia, New Zealand—North Island; Falkland Islands, Kermadec Islands, Pacific Islands, Japan, India, Ceylon, China, Korea, the Cape. Asa Gray thinks it was introduced into California with cattle. The spiny fruits of this species are as hard and also as sharp as needles, readily penetrate clothing or enter the fur and wool or feathers of living animals and birds, and in this way the plants are quickly and widely spread along tracks and roads and even into pastures and jungle.

An erect annual, 6-10 dm., glabrous or slightly pilose; stems square; leaves rarely entire, mostly bipinnately lobed, lobes 1-5, one being terminal; disk florets yellow; ray florets (sometimes lacking) white; outer involucre bracts appressed, lanceolate; fruits slender, elongated, gradually tapering towards the apex, black, needle-like, four-angled, crowned with two or four barbed awns.

First record for Britain: I. M. H., 1911. See *Rep. B.E.C.* 21, (1911) 1912. In the vicinity of Galashiels Skin-works on to the mouth of the Gala, Selk., thence along the banks of the Tweed for nine miles to Dryburgh, Roxb. It is of very frequent occurrence, the fruits being found in wool from all the pastoral divisions of Australia, New Zealand, Argentina and Cape Colony. They germinate freely, but the plants are of all aliens the most sensitive to frost, and the writers, though searching carefully, have never found them in the fruiting stage, but only in flower in September and October, 1911 and 1917. Named at Kew.



Fig. 35.

BIDENS PILOSA L.

1311 (3) *B. bipinnata* L.*Spanish Needles.*

Britton & Brown Ill. Fl. North. U.S., etc., iii. 439, t. 3945.

In North America—Rhode Island to Florida, west to Ohio, Nebraska and Arizona; Mexico; tropical America. Adventive in S. Europe, Asia, Australia—New South Wales, Queensland.

An erect annual, 3-15 dm., freely branched, rather slender; leaves thin, acuminate, petioled, 1-3, pinnately dissected into ovate or oblong, toothed or lobed segments; heads numerous, usually long stalked; involucre narrow, the outer bracts linear; rays 3-4, yellow, short or none; achenes linear, four-angled, narrowed upward into a beak 1.25 to 2.25 cm. long, the outer shorter and thicker than the inner; pappus barbed.

First found in Britain, I. M. H., September 1916, in the vicinity of woollen mills, Selkirk.

The short needles easily penetrate clothing and hides, while the downwardly barbed pappus also aids their attachment to animals. The needles are a pest, as one's clothing rapidly becomes full of them in a walk through fields where the plant is common.

306 GALINSOGA Ruiz & Pavon Fl. Peruv. 110, 1794.

A small genus of about a dozen species [4 D.T.], limited to South America, consisting of annuals with opposite three-ribbed leaves; small flower-heads in dichotomous cymes; the disk-like florets yellow, ray florets white: differing from *Bidens* in the prismatic fruits being crowned by a pappus of oblong, ciliated scales, without barbed awns. Named after Dr M. M. Galinsoga, intendant of the Madrid garden.

1312 *G. parviflora* Cav. Ic. iii. 41, t. 281, var. *adenophora* Thellung in Allg. Bot. Zeit. 9, 1915.

G. hirsuta Irvine in Rep. B.E.C. 13, 1861. Syme E.B. v. 764. Britton & Br. Ill. Fl. North. U.S., etc., iii. 442, f. 3954.

Tropical America, Peru, Chile, Argentina. Adventive in North America from Massachusetts to Oregon, North Carolina. Europe—England, Portugal, Sweden, Germany, Denmark, Italy, Austria, etc. In India, ascending to 2600 metres in the Himalayas. New Zealand—North Island; New South Wales.

Nearly glabrous, green, 2-7 dm., with opposite branches; leaves opposite, stalked, acute or slightly acuminate, ovate, bluntly serrate; flower-head hemispherical, of unequal, scarious, greenish bracts finely ciliated on the margin; achenes black, compressed, striate, with a pappus of white scarious scales a little shorter than the achenes but longer than the florets.

First record for Scotland: I. M. H., September 1912. Found among herbage on an embankment by the side of the Tweed about two miles below Galashiels, Roxb. A plant of strong growth but of rare occurrence. Flowering August to September. Det. A. Thellung.

This was noticed about Kew, Surrey, in 1887, and a vernacular name, Soldiers of the Queen, is there applied to it, originating from the corruption of Galinsoga into gallant soldier and finally into Soldiers of the Queen.

307 MADIA Molina Sagg. Chile 136, 1782.

A small genus of about a dozen annual species, chiefly Californian and Chilean, with alternate, entire or slightly toothed leaves; flower-heads small, yellow, ovoid or campanulate, clustered or loosely paniculate.

1314 M. sativa Molina, *l.c.*, 1782.

Madia, the Chilean name.

Tar-weed, the Californian name.

M. racemosa Torrey & Gray.

Roadsides and waste places in California, Oregon, Peru, Chile. Adventive in New Zealand—South Island.

Plant 3-10 dm., viscid-hirsute, glandular, heavy-scented; heads racemose or paniculate; ray florets 5-12, short, inconspicuous; disk florets 5; achenes obovate-oblong, those of the disk one-nerved down the side. A very variable species. The seeds contain a considerable percentage of fixed oil which is of commercial value. The plant was grown for this purpose and oil made at Aspull Stoneham, near Ipswich, in 1840.

First record: *M. sativa*, Tweed, Selk., J. Fraser in *Ann. Scot. Nat. Hist.* 43, 1909. In several places from Galafoot to Melrose, Roxb., I. M. H. in *Tr. Bot. Soc. Edin.* 42, 1909. Dr Thellung remarks *in litt.* "mihi dubia est."

310 (2) BAHIA Lag. *El. Pl. Hort. Matr. Gen. et Sp.* Nov. 30, 1816.

A genus, closely allied to *Schkuhria*, of about 16 species, named after J. F. Bahi, Professor of Botany at Barcelona. It consists of more or less woolly shrubs or herbs with tubular and radiate yellow flowers; ray florets one-seriate, pistillate, fertile; disk florets perfect, with 5-cleft limb; pappus (rarely absent) of several nerveless or costate scales; achenes glabrous or hispid. Natives of N. and W. America, Mexico and Chile.

1319 (10) Bahia sp. Dr Thellung suggests cf. **B. neo-mexicana** A. Gray in *Proc. Ann. Ac.* xix. 27, 1853.

A native of Colorado and Mexico. A plant found for the first time in Britain by I. M. H. in September 1916, among herbage, near woollen mills at Selkirk.

315 ACHILLEA (Vaillant) L.

A large genus of about 100 species represented in Europe, Asia and North America, named after Achilles, who is said to have discovered its medicinal virtues. It consists mainly of herbaceous perennials having chaffy scales in the receptacle, compressed fruits, not winged, and without pappus, characters which distinguish it from the allied genera of *Santolina*, *Anthemis*, *Matricaria*, *Anacyclus* and *Chrysanthemum*. Despite the discovery of Achilles no belief in the medicinal virtues now exists except in the minds of herbalists.

1331 *A. nobilis* L.

Reichb. Ic. t. 1024.

South and Central Europe—in rocky places and calcareous hills in France, Germany, Switzerland, Italy, Austria, Hungary, Poland, Transylvania, Serbia, Adriatic coast, Greece, S. Russia, Taurus, Caucasus, Bithynian Olympus. Adventive in Montpellier (*Thellung*).

Plant softly hairy or pubescent, 2-7 dm.; flower-head ovoid, shortly stalked; ligule white, shorter than the head; fruit rounded at top; leaves with an oval outline, subpinnatisect, the segments ultimately pinnatifid, with a tansy odour; rootstock short; root leaves narrow, dentate-serrulate; lobes much toothed. Differs from *Millefolium* in the fruit being rounded, not truncate at the apex.

First evidence: *A. nobilis*, Gala, Selk., 1875, in *Herb. Brit. Mus.*, and Kelso, Roxb., A. Brotherston in *Rep. Bot. Rec. Club* 187, 1876. Also Gala, 1882, A. Brotherston in *Herb. Druce*.

318 ANTHEMIS (Mich.) L.

A large genus of about 200 species [100 D.T., 70 Dur.] chiefly European, W. Asian, and N. African, consisting of herbaceous plants with alternate, toothed or pinnatisect leaves, often finely cut, and flower-heads stalked and terminal, with scaly receptacle, no pappus, and fruit not compressed. The name is derived from *anthemon*, a flower. The Chamomile, *A. nobilis*, is largely used in domestic medicine, and contains a volatile oil and bitter principle.

1340 *A. altissima* L. Sp. Pl. 843, 1753 = *A. Cota* L.

Reichb. Ic. t. 1008.

In S. Europe—Spain, France, Italy, Adriatic coast, Rhodes, Greece, S. Russia, Taurus, Anatolia, Syria, Mesopotamia, Persia.

Annual, 2-12 dm., sparingly pubescent; leaves bipinnatisect; heads large; ligules white; receptacle hemispherical; scales spathulate, abruptly contracted into an acuminate, spine-like point as long as the scale.

First found near the junction of the Gala and the Tweed near Gala-shiels, Selk., I. M. H., October 1910. Flowering in September and October. Named at Kew.

The British *A. Cotula* and *A. arvensis* L. occur by the Tweed, and may owe their occurrence to the local industry, the former as forma *latisepta* Thellung as well as the type.

321 MATRICARIA L.

A widely spread genus of about 60 [50 D.T., 23 Dur.] annual or perennial herbaceous plants, well represented in South Africa, with pinnatifid leaves, moderately large flower-heads, yellow disk florets, ray florets, if present, white, without scales on the conical receptacle,

and fruits truncate at the top. The name is derived from their former use in uterine affections, but they are no longer employed in medicine.

1362 *M. suaveolens* (Pursh) Buchenau. *Pineapple Weed* (Iowa).

M. discoidea DC. Prod. vi. 50, 1837. *M. matricarioides* (Less.) Porter. *Artemisia matricarioides* Less. in *Linnaea* vi. 210, 1831. *Santolina suaveolens* Pursh Fl. Amer. Septent. ii. 520, 1814.

Britton & Brown Ill. Fl. North. U.S., etc., iii. 460, f. 995.

Native of the Pacific coast of North America. Now adventive in waste places and along railways from Missouri to Maine. New Zealand—roadsides, abundant in the Auckland province district of the North Island. In England the earliest evidence possessed by G. C. Druce is a specimen in his herbarium collected near Kew by Nicholson in 1878, named *M. Chamomilla*, var. *discoidea*. Since that time it has spread over the greater part of Britain and through many of the Irish counties, and is a roadside pest in many places. Corn and fodder, however, rather than wool, appear to be the means of its introduction. It is a prolific seeder and threatens to become one of our very common species—its rapid dispersal being only equalled by that of the Canadian Water-thyme.

First evidence: Clovenfords and Galashiels, Selk., I. M. H., 1909.

1363 (3) *M. suffruticosa* (L.) Druce in Rep. B.E.C. 421, (1913) 1914.

Tanacetum suffruticosum L. *Matricaria multiflora* Fenzl. *Cotula tanacetifolia* Willd. *Pentzia tanacetifolia* Hutchinson. Fig. 36.

From Cape Town to Namaqualand and throughout the western districts, common. Very common near Cape Town.

Annual, much branched corymbosely, erect or diffuse, thinly pubescent; leaves sub-petiolate, bipinnatisect, the lobules linear, short or tooth-like, subacute; corymbs branched, many headed; heads bright yellow, small, sub-globose, discoid; involucreal scales broadly oblong, very obtuse, membranous-edged, nearly glabrous; pappus obsolete, rim-like, entire. See Harvey in Harvey & Sonder *Fl. Cap.* iii. 106.

First found in Britain, I. M. H., November 1913. See *Rep. B.E.C.* 16, (1913) 1914. Many plants of robust growth grew near the mouth of the Gala, Selk., also by the banks of the Tweed between Galashiels and Melrose, Roxb. Flowering August to October, even in November in favourable years. Det. A. Thellung.

If the South African plants hitherto associated with *Matricaria* having discoid flowers are removed to a separate genus *Pentzia* Thunb. em. Hutchinson, *l.c.*, this plant becomes *Pentzia suffruticosa* (L.) 1763, comb. nov., since the trivial *tanacetifolia* only dates from the *Systema* of 1767.



Fig. 36.

MATRICARIA SUFFRUTICOSA (L.) Druce.

- 1363 (4) *M. grandiflora*** (Thunb.) Fenzl ex Harvey in Harvey & Sonder *Fl. Cap.* iii. 166, 1864-65.

Tanacetum grandiflorum Thunb. *Cenocline grandiflora* Koch.
Pentzia grandiflora Hutchinson Kew Bull. 250, 1916.

South Africa—Cape, Olifant's River, Brackfontein and Kapallsloot.

Annual, stem robust, 3-5 dm., erect, pubescent, corymbose at summit; leaves half-clasping, bi-tri-pinnatisect, the pinnae several; lobules linear, callous-mucronate; flower-branches pedunculoid, corymbose, more or less fistular upwards; heads flattish-convex, discoid; involucre scales oblong, obtuse, rib keeled, tomentose, the innermost membrane-tipped; corolla four-lobed; pappus obsolete, sub-entire. Harvey, *l.c.* In *globifera* the involucre scales are glabrous and the head globose.

First found in Britain, I. M. H., October 1914. See *Rep. B.E.C.* 200, (1915) 1916. By the banks of the Tweed near its junction with the Gala, Selk., also by the Tweed half a mile further on, Roxb. Strong plants, but only found in the flowering stage in October.

- 1363 (5) *M. globifera*** Fenzl ex Harvey in Harvey & } *Stink-net.*
Sonder *Fl. Cap.* iii. 164, 1864-65.

Cotula globifera Thunb. *Tanacetum globiferum* DC. *Cenocline globifera* Koch. *Pentzia globifera* Hutchinson, *l.c.*

South Africa—a common weed throughout the colony.

Annual, 3-5 dm., much branched, glabrescent or sparsely pubescent; leaves petioled, bi-tri-pinnatisect, the lobules linear, short, sub-obtuse; flower-branches pedunculoid, naked, one-headed; heads quite globose, discoid; involucre scales oblong, obtuse, glabrous, membrane-edged; corollas four-lobed, lobes short, ovate; pappus denticulate, short.

First found in Britain, I. M. H., 1914. See *Rep. B.E.C.* 200, (1915) 1916. On the banks of the Gala half a mile below Galashiels, and at the junction of the Tweed, Selk. Flowering in October. Det. A. Thellung.

322 COTULA (Tourn.) L.

A genus of about 60 [50 D.T.] species, mostly small annuals or rarely perennials, chiefly African, but extending into Europe, India, Java; plentiful in Australasia, New Zealand, one being found in Tristan d'Acunha, and another in Brazil. Involucre hemispherical or campanulate with few, nearly equal bracts in two rows; receptacle flat, convex or conical, without scales; outer florets in one or more rows, female without a corolla, or with a short, broad or connival one; disk florets numerous; achenes flattened, sometimes winged, with no pappus; flower-heads small, pedunculate. *Cotula* signifies a little cup.

1365 C. coronopifolia L.*Brass Buttons.*

Dill. Hort. Eltham. f. 26. Figs. 37 and 38.

Wet places, Africa, Tunis (!), Madeira, the Cape, etc.; New South Wales, Victoria; common in wet pastures in Tasmania, also common even in brackish water, South Australia—Adelaide, Mount Lofty range, Kangaroo Island; West Australia—Swan River, etc.; New Zealand—North and South Island, Chatham Island, etc.; Oceania; South America—Chile, etc. Nyman thought it was adventitious in Europe and of South American origin. He cites it from Denmark, Germany, Holland, Spain (G. C. Druce saw it near Tarifa), Portugal, etc., and it is now naturalised in Cheshire; also adventive in California everywhere, and there called *Brass Buttons*.

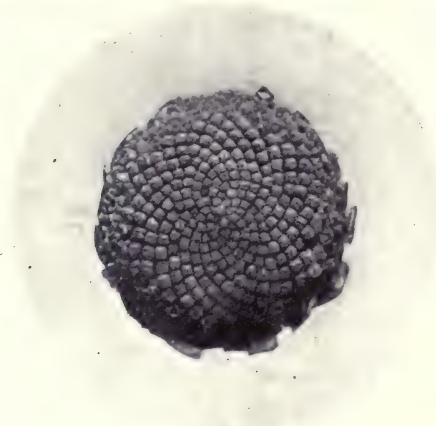


Fig. 37.

A flower-head of *COTULA CORONOPIFOLIA L.*

Leaves glabrous, rather succulent, mostly lanceolate or oblong, toothed; involucreal scales linear, discoid; heads bright golden-yellow, stalked, naked or with one or two small leaves; ray florets in one series.

First found in Scotland, I. M. H., Galashiels, Selk., August 1908, and recorded by J. Fraser in *Ann. Scot. Nat. Hist.* 42, 1909, and I. M. H. in *Tr. Bot. Soc. Edin.* 42, 1909; also plentifully by I. M. H. in each successive year and also on the Roxburgh side of the Tweed. Flowering August to September.

1365 (2) C. sororia DC. Prod. vi. 79.

South Africa, Graafreynet, at 1000-1300 metres; Uitenhage.

Thinly pilose, slender, diffuse or erect; leaves scarcely half-clasping at base, petiolate, the lower bi-pinnatifid, the upper pinnatifid;



Fig. 38.

COTULA CORONOPIFOLIA L.

lobes linear, mid-nerved, acute; peduncles filiform, short or longish, appressedly bristly under the flower-head; involucrel scales about 10, ovate-oblong, shorter than the disk, membrane-edged; ray flowers uniseriate, stipitate, without corolla. *Fl. Cap.* iii. 180. It resembles *C. australis*, but the female flowers are fewer.

First found in Britain, I. M. H., September 1913. See *Rep. B.E.C.* 200, (1915) 1916. Abundant on the banks of the Gala below Galashiels, Selk., also along the sides of the Tweed between Galashiels and Melrose, Roxb. Flowering June to September. Det. A. Thellung.

1365 (3) *C. australis* Hook. f. *Fl. New Zeal.* 128, 1853-55.

Strongylospermum australe Less. *Pleiogyne australis* Koch.
Fig. 39.

Australasia: New South Wales—Port Jackson to the Blue Mountains, invariably following sheep, Clarence River; Victoria—Yarra River, etc.; Tasmania—moist banks near Hobart Town; South Australia—near Adelaide; West Australia—Guildford, near Perth, between Swan River and King George Sound; New Zealand—abundant in low lying districts, North and South Islands, Kermadac and Chatham Islands, Tristan d'Acunha. Adventive in S. Africa, and Chile since 1871, near San Francisco, doubtless introduced with sheep, and in Switzerland.

Achenes of the female florets in several rows, with narrow, thick wings or obtuse edges; leaves dissected; stem slender; flower-stalks mostly longer than the dissected leaves; flower-heads very small, 2-4 mm., white.

First record: Tweed, Selk., one plant, J. Fraser in *Ann. Scot. Nat. Hist.* 42, 1909, and *Rep. B.E.C.* 349, (1908) 1909. Since found plentifully by the Tweed as far as Melrose, Roxb., by I. M. H., from 1909 to 1917. Flowering July to September. Det. A. Thellung.

1365 (5) *C. filifolia* Thunb. *Prod. Fl. Cap.* 161.

South Africa—in wet sandy spots about Cape Town; Australasia: Victoria; Tasmania; Islands of Kent's group; South Australia—Murray River, Gawler River; West Australia—King George Sound.

A small, much branched annual; leaves linear or filiform, quite entire, not sheathing; involucrel bracts broad; disk achenes not winged; flower-stalks filiform, naked.

First found in Britain, I. M. H., on the banks of the Gala below Galashiels, Selk., October 1911. See *Rep. B.E.C.* 21, (1911) 1912. Of rare occurrence. Flowering September to October; fruit not ripening. Det. J. Hutchinson, Kew.



Fig. 39.

COTULA AUSTRALIS Hook. f.

1365 (6) *C. villosa* DC. Prod. vi. 79, 1837.

South Africa—Cape (*Burchell*).

Whole plant villous-hispid, erect and branched ; leaves sessile, pinnatipartite, the lobes of the lower leaves trifid, of the upper entire, oblong-linear, mucronate ; branches leafless at top, one-headed, pubescent ; involucre scales membrane-edged, elliptic-oblong, obtuse ; achenes very thick, muriculate in the disk. DC., *l.c.*

First found in Britain, I. M. H., Galashiels, abundant by the Gala and the Tweed, Selk., August to October 1911. See *Rep. B.E.C.* 21, (1911) 1912. Det. J. Hutchinson, Kew.

1365 (8) *C. pusilla* Thunb. Prod. Fl. Cap. 162.

South Africa—sandy places, Zwartland, etc.

A very small annual with alternate, glabrous leaves sheathing at base, pinnatipartite, the lobes linear, acute ; involucre scales few, broadly elliptic or oblong, obtuse, membrane-edged ; ray florets uniseriate ; achenes hispid on the inner face. The leaves resemble those of *coronopifolia*, the involucre scales those of *filifolia*, but the hispid achenes separate it from both.

First found in Britain, I. M. H., Galashiels, August 1913. See *Rep. B.E.C.* 201, (1915) 1916. On the banks of the Gala, Selk., and the Tweed, Roxb., as in the case of *C. sororia*, but much less plentifully. Flowering August to September. Det. A. Thellung.

This plant was at first thought to be *C. tenella*.

1365 (9) *C. Zeyheri* Fenzl ex Harvey in Harvey & Sonder Fl. Cap. iii. 180, 1864-65.

South Africa—Hassaquaskloof, and near the Zwartkops River.

A slender annual with alternate, variably pilose, half-clasping, simply pinnatisect leaves with linear lobes ; flower stalks filiform, with a few, distant, simple leaves ; involucre scales oblong, glabrous, broadly membrane-edged ; achenes with a very wide membrane wing ; disk florets hispidulous, with oblong achenes.

First found in Britain, I. M. H., Galashiels, Selk. See *Rep. B.E.C.* 201, (1915) 1916. Det., with some little doubt, A. Thellung.

1365 (10) *C. macroglossa* Bolus ex Schlecht. in Eng. Bot. Jahrb. xxvii. 209, 1899.

Africa—South-west Gydoner Cold Bokkeveld at 1000 metres.

Annual, small, sub-caespitose, softly hairy, 10-18 cm. ; stem short ; leaves alternate, stalked, pinnatipartite, segments linear, 2-3-fid, acute, dilated and decurrent at base, 2-3 cm. long ; involucre bracts, outer about 8, oblanceolate, acute or acuminate, pilose, longer than disk, inner shorter, obtuse ; ray florets in one series, 6-8 ; ligules oblong, obtuse, 5-8 mm. long ; achenes stipitate ; disk florets numerous ; limb four-lobed ; achenes subglabrous.

First found in Britain, I. M. H., mouth of the Gala, August 1913.
See *Rep. B.E.C.* 201, (1915) 1916. Of rare occurrence; flowering August to September. Det. A. Thellung.

322 (2) CENIA Comm. ex Juss. Gen. 183, 1789.

A small South African genus of about 10 species closely allied to *Cotula*, into which it is merged in the *Pflanzenfamilien* iv. 5, 280, 1892, and in Dalla Torre and Harms *Gen. Siphonog.* 559, 1905, but differing in the marginal rays, which are not always present, and specially in the hollow top-shaped apex of the peduncle, which is very conspicuous in the fruiting heads; hence the name from *kainos*, empty or hollow. Harvey & Sonder *Fl. Cap.* iii. 184.

1365 (23) C. turbinata Pers. Syn. ii. 465, var. **concolor** Harvey in Harvey & Sonder *Fl. Cap.* iii. 184, 1864-65.

Cotula turbinata L. *Lidbeckia turbinata* Thunb. Fig. 40.

South Africa—a common weed throughout the colony. Adventive in New Zealand—North Island and on ballast at Wellington.

A diffuse, much branched annual, copiously pubescent or pilose, the stems slender; involucrel scales marked with 3-5 nerves, the outer row of the ligulate flowers rather longer than the involucre; the rays pale yellow on both sides.

First found at Galashiels, Selk., I. M. H., 1908, and exhibited as the var. *concolor* before the Botanical Society of Edinburgh, November 12, 1908. See *Tr. Bot. Soc. Edin.* 3, 1909, and *Rep. B.E.C.* 349, (1908) 1909.

Var. **DISCOLOR** Harvey, *l.c.*

Differs in the ligules being purplish beneath.

First found at Galafoot, Selk., I. M. H., September 1913, and recorded in error in *Rep. B.E.C.* 16, (1914) 1915, as *C. tuberculata*, not, as it should have been, *C. turbinata*, var. *discolor*. Det. A. Thellung.

322 (3) CENTIPEDA Loureiro Fl. Coch. 492, 1790.

Myriogyne Less. in *Linnaea* vi. 219, 1831.

A small genus of 5 small annual species, two occurring in Australia and one in tropical South America. Common in India. It is closely allied to *Cotula*, from which it differs in the habit and in the achenes being only very slightly compressed with 3 or 4 very prominent ribs or angles and no pappus. The Latin *centipeda* means a hundred-footed and applies to the well-known poisonous pest, and Pfeiffer derives the name from the numerous (? 100) feet, by which the plant is attached to the soil.

1365 (31) C. minima Br. & Aschers Ind. Sem. Hort. Berol. App. 6, 1867.

Cotula minuta Forst. Prod. 57, 1786. *Myriogyne minuta* Less.



Fig. 40.

CENIA TURBINATA Pers., var. *CONCOLOR* Harvey.

Centipeda orbicularis Loureiro. *C. minuta* C. B. Clarke Comp. Ind. 151, 1876. *Artemisia minima* Thunb. Fl. Jap. 311, 1784 (? of L.). Bailey & Gordon's Poisonous Plants, t. 37.

Australasia: North Australia; Queensland; New South Wales, where it has proved poisonous to stock; Victoria—very common in marshy places; Tasmania; South Australia—common on the Murray River; West Australia; New Zealand—North and South Islands, not uncommon up to 600 metres; Asia—India, Afghanistan, Mascarene Islands, Ceylon, Malay, Cochin China, China, Formosa; Pacific Islands.

Flower-heads nearly all sessile and lateral, 3-4 mm: diameter, solitary; florets very minute, the female ones not more than a third the length of the ovary. A prostrate, branching annual or (?) perennial with slender stems and oblong, toothed leaves, glabrous or clothed with short, white, woolly, intricate hairs; achenes slightly hairy.

First found in Britain, I. M. H., August 1913. See *Rep. B.E.C.* 326, (1913) 1914. Banks of the Gala below Galashiels, Selk., and on the shingle two miles further on by the Tweed, Roxb. Flowering August to September.

322 (4) *SOLIVA* Ruiz & Pavon Prod. 114, t. 24, 1794.

A small South American genus of about 10 [6 D.T.] species belonging to the Anthemideae, and chiefly differing from *Cotula* in the sessile flower-heads and the flattened achenes, crowned by the hardened style or by two prominent, divaricate angles. They are small, diffuse herbs with alternate, usually finely divided leaves; the receptacle flat, without scales, the outer female florets without corolla, in several rows.

1365 (40) *S. sessilis* Ruiz & Pavon Syst. Veg. 215, 1798.

Brazil, Argentina, Paraguay, Chile—Coquimbo, Concepcion, on adobe walls and dry places. Adventive in New Zealand in waste places in the Lower and Middle Waikato.

A caespitose, villous species with petiolate, pinnatipartite leaves, with acute, linear lobes; sessile inflorescences (hence the name); winged, pilose achenes.

First found in Britain, I. M. H., August 1913. See *Rep. B.E.C.* 326, (1913) 1914. On the shingle near the junction of the Gala and the Tweed, Selk. Rare, but being very small, might easily escape notice. Flowering August.

1365 (41) *S. anthemifolia* (Juss.) R. Br. in Tr. Linn. Soc. xii. 102, 1817.

Gymnostyles anthemifolia Juss. Fig. 41.

Mexico; Brazil—Rio Janeiro. Adventive in Australia: Queensland—by the Brisbane River; New South Wales—Port Jackson,



Fig. 41.

SOLIVA ANTHEMIFOLIA (Juss.) R. Br.

but only in cultivated ground; New Zealand—North Island on alluvial flats by the Northern Wairoa River.

Stems very much shorter than leaves, forming dense tufts; leaves much divided, clothed with long, soft hairs or nearly glabrous; flower-heads nearly globular when in fruit, 6-12 mm. in diameter: involucre bracts oblong or lanceolate; achenes numerous, bordered by a thick, transversely rugose wing, which tapers into a rigid style, longer than the achene itself, without any lateral angles or points.

First found in Britain, I. M. H., Galashiels, Selk., October 1914. See *Rep. B.E.C.* 201, (1915) 1916. Also under shrubs at Selkirk in 1916. A striking peculiarity of this plant is the position of the fruits which appear in clusters just above the root. Flowering August to October. Det. A. Thellung.

1365 (42) *S. sp. cf. nasturtiifolia* (A. Juss.) DC. Prod. vi. 142, 1837.

Gymnostyles nasturtiifolia A. Juss.

South America.

A small, caespitose, subvillous plant with leaves shortly petiolate, pinnatipartite; capitula sessile; achenes cuneiform, the margins tuberculate-rugose.

First found by I. M. H. near the Ettrick at Selkirk in September 1916. Flowering September to October.

The above, doubtfully determined by A. Thellung, requires confirmation.

322 (5) *ISOETOPSIS* Türczanninow in Bull. Soc. Nat. Mosc. xxiv. i. 174, 1851.

Involucre of a few, broad, scarious bracts, the outer ones with linear leaf-like tips; receptacle small, without scales, but with a few long hairs; ray florets in several rows, female tubular; disk florets hermaphrodite, but sterile; achenes and pappus of disk abortive or rudimentary. A monotypic genus named from its resemblance to an *Isoetes*.

1365 (50) *I. graminifolia* Türczanninow, l.c.

Australia: New South Wales, Victoria, South Australia—in the Murray scrub, West Australia.

A dwarf, tufted herb with grass-like radical leaves, 2.5-7.5 cm. long; flowers about as long as involucre; achenes of female flowers rather thick, silky-hairy.

First found in Europe, I. M. H., 1916. On the banks of the Tweed between Galashiels and Melrose, Roxb. Flowering August. Det. A. Thellung.

324 *ARTEMISIA* (Tourn.) L.

A large genus of over 200 species of world-wide distribution best represented in the northern hemisphere, so named from *Artemis*, one of the names of Diana; consisting of herbaceous or suffruticose, often aromatic plants, having a naked receptacle; no rays to the florets; the heads small, racemose or paniced, often nodding; the achenes mostly rounded at the top without pappus; and the leaves bi-tripinnatisect.

1370 A. scoparia Waldst. & Kitaibel Pl. Rar. Hung. 66, t. 65, 1802.

Sandy and arid places in Central and Eastern Europe, N. Germany, Austria, Hungary, Poland, Transylvania, Serbia, Dalmatia, Montenegro, Russia, Central and South Asia throughout, Taurus, Caucasus, Asia Minor, Persia, Siberia, Afghanistan, Beluchistan (where it is used as a goat fodder and a cure for ear-ache), India—Gangetic Plain, Kashmir; West Tibet to 4000 metres, China, Korea, Japan, Kamchatka. Adventive at Montpellier (*Thellung*), where Touchy found it in 1858.

Annual, with glabrous achenes, the receptacle naked, the head with outer florets female, those of the disk hermaphrodite, sterile; leaves ovate-orbicular in outline, bipinnatisect into obtuse, spathulate, decurrent divisions; the heads small, globose, nodding, shortly stalked; involucre bracts shining, ovate, broadly scarious.

First found in Selk., I. M. H., September 1909, among herbage, but rarely, near the mouth of the Gala. Flowering and fruiting freely from August to September. Named at the Edinburgh Herbarium.

1375 A. compacta Fisch. ex DC. Prod. vi. 102.

Central Asia.

Perennial; flowers all perfect; receptacle naked; stigma enlarged into a ciliated disk at summit; stem erect, paniculate; lower leaves stalked, sub bipinnatisect, lobes trifid; stem leaves less divided, the upper entire; head ovoid, 1 (?) to 5 flowers; involucre scales scarious.

First record: Tweedside, Melrose, 1868, Stuart in *Proc. Berw.* 80, 1869-72.

1380 A. biennis Willd. Phyt. ii. 1794.

Britton & Brown Ill. Fl. North. U.S., etc., iii. 465, f. 4008. Weed Fl. of Iowa 367, 492. Fig. 42.

North America—North West Territory to north-west United States. Adventive from Manitoba to Nova Scotia, south to Missouri, Kentucky, and Pennsylvania. West Tibet—Topidunga up to nearly 5000 metres; Sikkim. Adventive in Holland, Switzerland, Germany, etc.

An aromatic (? flowers only), somewhat bitter, smooth annual or biennial herb, 3-10 dm., with leafy stem and erect branches; lower leaves pinnately-partite, the upper pinnatifid, lobes linear or oblong, serrate; flowers inconspicuous; ray florets absent; involucre bracts green, scabrous-margined; heads numerous, in short axillary spikes.

First found, I. M. H. and G. C. D., near the junction of the Gala and the Tweed, Selk., 1911. Flowering from August to October. Det. G. C. Druce.



Fig. 42.

ARTEMISIA BIENNIS Willd.

1383 (3) *A. afra* Jacquin Hort. Schoenbrunnensis, t. 467, iv. 34, 1804.

South Africa: Cape—Grahamstown, Bushman's River; Natal—Keiskamma Hoek.

Perennial; stem robust, 7-10 dm., much branched and leafy, tomentose; leaves bipinnate, stalked; racemes in a much branched terminal panicle, heads small, 3-4 mm., drooping; involucrel scales oblong, obtuse, scarious, canescent at back, with a green central line; corolla naked; receptacle conical, pilose.

First found in Britain, I. M. H., August 1915. See *Rep. B.E.C.* 201, (1915) 1916. Growing among herbage by the side of the Tweed near its junction with the Gala, Selk. Flowering August to September. Det. A. Thellung.

327 (2) *ERECHTITES* Rafin. Fl. Ludov. 65, 1817.

Neoceis Cass.

A genus of nearly 20 species [15 D. T.] occurring in South America, Australia, New Zealand and one in Java; closely allied to *Senecio* but differing in the constantly filiform female florets. Of the six Australian species three are endemic, the other three extending to New Zealand. They consist of annual or perennial herbs with alternate, entire, toothed, lobed or pinnately-divided leaves; the flower-heads in terminal corymbs; florets all tubular, usually yellow, small, the outer ones in two or more rows, female filiform, 3 or 4-toothed; disk florets hermaphrodite, 5-toothed, anthers obtuse at base; pappus of numerous, simple, fine, capillary bristles. The species are critical and not easy to identify.

1389 (4) *E. prenanthoides* DC. Prod. vi. 296, 1837.

Senecio prenanthoides Rich. Fig. 43.

Australasia: New South Wales—Port Jackson, etc.; Victoria—Wendu Vale, Dandenong Ranges and Gippsland; Tasmania—Kent's Group, margins of streams in cool shady places; West Australia; New Zealand—North and South Islands, Stewart and Chatham Islands, from sea-level to 1000 metres.

A tall perennial, 3-13 dm., simple or branched above, glabrous or slightly hairy, not woolly; leaves 5-15 cm., linear-oblong to lanceolate-acuminate, rather distant, shortly stalked, upper sessile, with toothed auricles, membranous, regularly or irregularly closely and finely denticulate, rarely lobed; flower-heads very numerous in a large, lax, terminal corymb, 15-30 cm. across; heads quite glabrous, 6 mm. long; involucrel bracts 8-10, narrow linear, green with white margins; florets 18-22; achenes linear oblong, grooved, hairy. See Cheeseman *Fl. N. Zeal.* 364.

First found in Britain at Galashiels, I. M. H., August 1913. See *Rep. B.E.C.* 16, (1914) 1915, and 201, (1915) 1916. A short distance below the mouth of the Gala, Selk., and along the Tweed



Fig. 43.

ERECHTITES PRENANTHOIDES DC.

at various places for five miles south to Newstead, Roxb. A tall, hardy species, rather frequent. Flowering August to November. Exhibited at the Linnean Society April 2, 1914. Named at Kew.

1389 (5) *E. quadridentata* DC. Prod. vi. 297, 1837.

Senecio quadridentatus La Bill.

Australasia: Queensland—Moreton and Keppel Bay; New South Wales—Port Jackson, rocky hills near Bathurst; Victoria—Wendu Vale; Tasmania—Bass's Straits, etc.; South Australia—Spencer's Gulf, Wimmera, etc.; West Australia—Swan River, etc.; New Zealand—North and South Islands, Chatham Island up to 1100 metres.

An erect perennial, 3-10 dm., everywhere more or less clothed with white cottony tomentum; leaves 5-15 cm., linear-elongate, entire or minutely remotely toothed, margins revolute; corymbs terminal, broad, lax; heads 6 mm. long with about 30 florets; involucre bracts 12-14, narrowly linear-lanceolate, acuminate, glabrous and cottony; achenes like the preceding.

First found in Britain, I. M. H., October 1913. See *Rep. B.E.C.* 16, (1914) 1915. On a bank overhanging the Gala, half a mile below Galashiels, Selk., also on an embankment by the Tweed 1½ miles further on, Roxb. Flowering September to October. Exhibited at the Linnean Society April 2, 1914. Named at Kew.

1389 (6) *E. arguta* DC. Prod. vi. 296, 1837.

Senecio argutus Rich.

Australasia: New South Wales—Port Jackson, Clarence River, etc.; Victoria—Wendu Vale, Yarra Yarra; Tasmania—not uncommon in waste places; South Australia—Cudnaka, Kangaroo Island, etc.; West Australia; New Zealand—North, South, and Stewart Islands, abundant.

A coarse, erect annual, 3-10 dm.; stem stout, grooved, branched above, more or less cottony or woolly, rarely glabrous; leaves 5-10 cm., linear-oblong or lanceolate, acute or obtuse, the upper sessile, with a broad, toothed, stem-clasping base, coriaceous, coarsely and irregularly toothed or lobed or pinnatifid, lobes sinuate, dentate; corymbs terminal, dense; pedicels slender, cottony; involucre bracts 12-14; florets 30-40; achenes hairy. See Cheeseman *Fl. N. Zeal.* 364.

First found in Britain at Galashiels, Selk., I. M. H., 1915. See *Rep. B.E.C.* 201, (1915) 1916. Det., with some doubt, A. Thellung.

328 SENECIO (Tourn.) L.

Probably the largest genus in the world, numbering nearly 1500 [1200 D. T., 960 Dur.] species of almost world-wide distribution, being specially well represented in South Africa in the Old, and in

the Andean regions of South America in the New World. While some species like the Common Groundsel are well nigh ubiquitous, others have an extremely local range. The genus is composed of annuals, biennials, herbaceous perennials, suffruticose and even arborescent plants, usually with yellow flowers, rarely pure white or purple or violet, and sometimes, as in the cultivated *Cinerarias*, exhibiting a wonderful series of magnificently bright colours. The name, used by Pliny, is derived from *senex*, old, because of the white hair-like pappus. The plants are characterised by the involucre bracts being arranged in a single row with a few small ones at the base, the margins often scarious and imbricate; receptacle naked, not chaffy; pappus of numerous, usually fine and soft, capillary, simple, scabrous or denticulate bristles; florets of the ray, when present, female or rarely neuter, ligulate.

1396 *S. squalidus* L.

Oxford Rag-wort.

Syme E. B. v. t. 753.

A native of Sicily and Calabria, now well established at Oxford and Reading and spread thence along the railways as far as Cardigan, Dorset, Devon, London, Warwick, Salop, Northants, etc.; Cork, etc., Ireland, and indicated also in Carniola, Transylvania, etc.

A glabrous, large-flowered annual or perennial with silky or sometimes glabrous fruits, the phyllaries usually black-tipped and the leaves normally lyrate-pinnatifid, but excessively variable in leaf-cutting.

First record: Galafoot, Selk., 1908, J. Fraser in *Ann. Scot. Nat. Hist.* 101, 1911.

We have not seen Scottish specimens.

1403 (2) *S. lyratus* L. f. Suppl. 369, 1781, not of DC., etc.

South Africa: Cape—summit of Table Mountain, Cape Flats, Swellendam, Uitenhage.

This belongs to Harvey's (*Fl. Cap.* 350) section *Rigidi* and to the division with radiate, yellow heads and leaves sessile or decurrent, not stalked. It is a herbaceous species, more or less scabrous, with minute, rigid pubescence; stem terete, striate, pithy; cauline leaves stem-clasping, variable in shape, lyrate or lacero-pinnatifid, or the upper ones narrow-oblong, all sharply and unequally toothed, lobes short, unequal, terminal one longer; heads radiate, about 30-flowered; involucre calyced, glabrous, of many narrow scales; rays 6-8, yellow; achenes small, minutely hispidulous.

First found in Britain, I. M. H., September 1914. See *Rep. B.E.C.* 201, (1915) 1916. Among herbage by the side of the Tweed between Galashiels and Melrose, Roxb. Flowering August to September. Det. A. Thellung.

1406 *S. brasiliensis* Less. in *Linnaea* vi. 249, 1831.

S. canabinaefolius Hook. & Arn. in Hook. Journ. Bot. iii. 341, 1841.

Brazil ; marshes of La Plata, near Buenos Aires.

Glabrous, with flexuous, striate branches ; leaves generally about 7.5 cm. long, unequal, deeply bi-tri-pinnatifid, or rarely pinnatisect, with narrow acuminate laciniae ; corymbs compound, without leaves and sparsely bracteate ; involucre ovate-cylindric, the bracts about 20, acute, not sphacelate ; ligules 8-10, broad, shorter than disk.

First found in Britain at Galashiels, Selk., A. Brotherston, and recorded as *S. cannabinaeifolius* in *Proc. Berw.* 270, 1874, and *Rep. Bot. Rec. Club*, 1874.

1407 *S. aegyptius* L., var. *arabicus* (L. Mant. 114), comb. nov.

S. aegyptius, var. *discoideus* Boiss. *Fl. Orient.* iii. 388.

Egypt—on the banks of the Nile, frequent, also a common plant in Cordofan and Nubia.

Annual, glabrous or nearly so, 25-70 cm. high, not much branched, leafy ; leaves pinnatipartite or pinnatifid, 2-6½ cm. long, upper sessile, amplexicaul or slightly stalked, with an auriculate base, lower leaves narrowed into a stalk, lobes dentiform ; heads campanulate, 5 mm. long, on slender pedicels 8 mm. long ; phyllaries linear with lanceolate tip and scarious margin, equalling the pappus ; ligule, in the type, revolute, very short, in the variety, absent ; achenes puberulous all over with short hairs.

First found at Galashiels, Selk., I. M. H. See *Rep. B.E.C.* 349, (1908) 1909.

Professor Trail found it at Aberdeen on the Links in 1907. See *Ann. Scot. Nat. Hist.* 58, 1908.

1408 *S. juniperinus* L. f. Suppl. 371, 1781.

South Africa : Cape—Uitenhage, Zuureberg, Stormberg, Witberg and Hassaquaskloof ; Natal. Widely distributed over British Kaffraria, a farmers' pest.

This belongs to the very large section *Rigidi* of Harvey (*Fl. Cap.* iii. 349), which consists of shrubs or under-shrubs commonly much branched, leafy ; heads calyced, corymbose. *S. juniperinus*, although rigid and strong, is scarcely ligneous except at the base, the branches numerous, more herbaceous, but wiry ; leaves cobwebbed or nude, half-clasping and often unidentate at base, linear-subulate or linear-lanceolate, subpungent-mucronate with revolute or recurved margins, either entire or sparingly toothed or furnished with a pair of opposite, horizontal lobes, scabropunctulate and glabrate, cobwebbed above, albo-tomentose below ; heads 40-60 flowered, radiate ; involucre calyced, of 12-15 glabrous, barbellate scales ; rays about 12, yellow ; achenes nearly glabrous or minutely puberulous. See *Fl. Cap.*, l.c.

First found in Britain, I. M. H., September 1913. See *Rep. B.E.C.* 326, (1913) 1914. Among herbage by the Tweed south of

Galashiels, Selk. and Roxb. Of robust growth. Flowering August to October. Named at the Edinburgh Royal Botanic Gardens.

1408 (2) *S. lautus* [Sol. ex Forster f. Fl. Insul. Austral. Prod. 91, 1786] nomen. A. Richard Essai Fl. Nouv. Zel. 257, 1832.

S. carnulensis DC. Prod. vi. 372, 1837. Figs. 44, 45, and 46.

Australasia: Queensland—Hervey's Bay, on the Upper Maranoa, etc.; New South Wales—Port Jackson, northwards to Hastings and Mount Mitchell, southwards to Twofold Bay, Lachlan and Darling Rivers, etc.; Victoria—from the Glenelg to Gippsland and in the interior to the Grampians and the Murray River; Tasmania—abundant, especially near the coasts; South Australia—from the Murray River(!) to Vincent's Gulf and Kangaroo



Fig. 44.

SENECIO LAUTUS A. Richard.



Fig. 45.

SENECIO LAUTUS A. Richard.

Island; West Australia—from the south coast to Vasse and Swan Rivers, and eastwards to Cape Legrand and Esperance Bay, Coolgardie; New Zealand—abundant near the sea, ascending to 1400 metres in North, South, Kermadec, Stewart and Chatham Islands, and there very variable.

An exceedingly polymorphic, much or sparingly branched, glabrous or pubescent, annual or biennial herb, 6-24 in. high; stems stout or slender, erect or decumbent or almost prostrate, grooved, flexuous; leaves 1-2 in. long, linear or linear-lanceolate, or linear-oblong to oblong, either narrowed into a petiole or dilated with stem-clasping auricles at the base, entire or remotely toothed or lobed or pinnatifid; lobes narrow or broad, heads in few or many flowered corymbs $\frac{1}{2}$ in. to $\frac{3}{4}$ in. diameter, campanulate; involucre bracts herbaceous, linear, acute, pubescent at the tips, usually prominently two-ribbed; outer bracts few, small; ray florets 10-15, with spreading or revolute ligules, rarely absent; disk florets numerous, scarcely longer than the involucre; achenes linear, grooved, pubescent or nearly glabrous; pappus hairs copious, soft, white. See Cheeseman *Fl. N. Zeal.* 373, 1906.



Fig. 46.

SENECIO LAUTUS A. Richard.

First found in Britain, I. M. H., August 1908 and exhibited at the Botanic Society of Edinburgh November 1908. See *Rep. B.E.C.* 349, (1908) 1909, and *Ann. Scot. Nat. Hist.* 42, 1909. By the banks of the Gala below Galashiels, Selk., and at many places along the Tweed for nine miles to Dryburgh, Roxb. Perhaps the commonest and most showy of the wool aliens, and one of the few Australian plants capable of surviving the rigour of a Scottish winter. I. M. H. has seen it blooming in January. The average height is 6-10 dm., but in a garden within three

years it has attained 15 dm., branching to a width of 12 dm., and bearing over a thousand blooms. Plants of this species vary considerably in the shape of the leaves, and increase by rooting along the old wood whereby one plant attained 6 metres in circumference. Flowering August to November and in January. Exhibited at the Linnean Society December 1, 1910. Determined at the National Herbarium, South Kensington, and by A. Thellung.

This striking and showy plant, along with *Acaena* and *Rumex Brownii*, affords an excellent illustration of a naturalised Australasian species, due to the wool industry. *S. lautus* seeds itself at Galashiels. In 1917 it occurred near the Skin-works in Abingdon, Berks. (*G. C. Druce*).

1408 (3) *S. hieracioides* DC. Prod. vi. 384, 1837.

South Africa—Los Tafalberg, Kaffirland, 1800-1900 metres (*Drege*).

One of the 177 species described by Harvey in *Fl. Cap.*, but in this instance he had not seen the specimen. It is put in his Sinuosi section with perennial rootstock and leaves mostly sinuous and generally pubescent or viscidulous. It has radiate, yellow flowers with the crown of the rootstock not silky or woolly; radical leaves oblong, toothed, about 8 cm. long and 8 mm. wide, stalked; involucre bracts with about 12 puberulous scales; ray florets 8-10, pale yellow, shorter than the involucre; achenes striate, pubescent.

First found in Britain, I. M. H., September 1911. See *Rep. B.E.C.*

• 22, (1911) 1912. By the Tweed at its junction with the Gala, Selk. Flowering August to September. Det. De Candolle.

1408 (4) *S. brachyglossus* F. v. Muell. in *Linnaea* xxv. 525, 1852.

Erechtites brachyglossa Sonder. Fig. 47.

Australasia: New South Wales—Darling River, between Stokes Range and Coopers Creek; Victoria—near Melbourne, Wimmera, etc.; South Australia—near Adelaide; West Australia—Swan and Murchison Rivers.

A slender annual, 6 inches to a foot or rarely 1½ feet high, glabrous or sprinkled with a few, short, white hairs; leaves linear with a few, small, distant teeth, or irregularly pinnatifid with a few, distant, linear lobes; flower-heads small, solitary or clustered at the ends of the branches of a loose irregular panicle; involucre cylindrical of about 8 bracts, about 2 lines long, with 1 or 2 minute outer ones; ray florets about 6, the ligules oblong, very short and rolled back; disk florets 10-12, slender, 5-toothed, scarcely exceeding the involucre; achenes densely pubescent, those of the ray usually longer than those of the disk. See Benth. *Fl. Austral.* iii. 670, 1866.

First found as a few plants in the shingly bed of the Gala and Tweed,



Fig. 47.

SENECIO BRACHYGLOSSUS F. v. Mueller.

Selk., I. M. H., August 1908. Exhibited at the Botanic Society of Edinburgh November 1908. See *Rep. B.E.C.* 349, (1908) 1909, and J. Fraser in *Ann. Scot. Nat. Hist.* 42, 1909. It appeared again in 1909 and in successive years, but never abundantly. Flowering August to October. Named at Kew.

1408 (7) *S. pterophorus* DC. Prod. vi. 389, var. **suberratus** (DC.) Thellung in *Rep. B.E.C.* 17, (1914) 1915.

S. pterophorus DC., var. *apterus* Harvey in Harvey & Sonder Fl. Cap. iii. 386.

South Africa: Natal—between Omtendo and Omsamculo, etc., for the type.

This belongs also to Harvey's *Rigidi* and is put by him close to *juniperinus*, from which it differs in its broader, lanceolate leaves, which are glabrous and green above but cano-tomentose below, the rays from 8-10. The var. *apterus* Harvey is described as having the wings of the stem obsolete or none. It is the *S. polyanthemus*, var. *suberratus* DC., *l.c.*

First found in Britain, I. M. H., September 1913. See *Rep. B.E.C.* 17, (1914) 1915. Found on the banks of the Gala near Gala-shiels, Selk. Of rare occurrence. Flowering August to September. Det. A. Thellung.

1408 (22) *S. macrodontus* DC. Prod. vi. 373, 1837.

S. australis Willd. Sp. Pl. iv. 1918, var. *macrodontus* Benth. Fl. Austral. iii. 669.

New South Wales—near Port Jackson, etc.

Plant 3-10 dm. high; leaves broadly lanceolate, somewhat auricled at base, not whitish underneath in the Tweed plant, with rather prominent teeth; flower-heads numerous in a terminal, glabrous corymb; involucre cylindrical, 4-5 mm. long; ligule not longer than involucre; disk florets 10-15.

First found in Europe, I. M. H., September 1914. See *Rep. B.E.C.* 417, (1916) 1917. Robust plants, 1 metre high, found on an embankment by the side of the Tweed about two miles below Gala-shiels, Roxb. Flowering August to September. Det. G. C. Druce.

Dr Thellung suggested its affinity with *S. australis* of which Bentham makes it a variety, but it appears to be a good species, and the Tweedside specimens are practically identical with Australian *macrodontus*.

331 CRYPTOSTEMMA Br. in Ait. Hort. Kew. v. 141, 1813.

A very small (2) genus of Cape plants, closely allied to *Arctotis* with which it is united by Dalla Torre, differing only in the pappus, from which the name (*crypto*, hidden, and *stemma*, a crown) is derived, the pappus being hidden among the hairs of the achene. The plants are

more or less tomentose, especially on the under side of the leaves which are variable in incision and size; the rays are pale yellow with a dark disk; the achenes wingless and thickly clothed with long, soft hairs.

1412 C. Calendula Druce in Rep. B.E.C. { *Cape Dandelion*, Cape
416, (1913) 1914. } *Weed* (Australia).

Arctotis Calendula L. Sp. Pl. 922, 1753. *Calendula Calendulaceum*
Br. in Ait. f. Hort. Kew. v. 141, 1813.

South Africa—roadsides and waste places throughout the colony. Adventive in Australia, first noticed there in 1850 on the Gawler Plains; Victoria—common about Melbourne, the whole pastures in autumn being strewn with its woolly pellet-like achenes. When in flower “as far as the eye can reach a yellow carpet only is seen.” Tasmania—introduced about Hobart Town; South Australia—very common on roadsides about Adelaide(!), the ground being covered with it, also near the Murray River; West Australia—abundant about Perth(!), Coolgardie; New Zealand—North Island; Portugal—near Belem, Lisbon(!); Spain—Corunna.

A most variable plant, sometimes stemless and creeping with rosettes of leaves, sometimes erect; branches 3-7 dm.; leaves most variable in cutting and pubescence, green above or tomentose on both sides; achenes hidden in a very thick coat of silky wool; flowers conspicuous from the pale yellow ray and purplish brown disk. The Tweeds side plant has rather narrow leaves.

First found in Scotland at Galashiels, I. M. H., October 1911, on the banks of the Gala below Galashiels, Selk., and also along the Tweed towards Melrose, Roxb. Flowering September to October. Still there in 1917. Det. A. Thellung.

331 (2) **BERKHEYA** Ehrh. Beitr. iii. 137, 1788.

A genus, named after Lefrang von Berkhey, of about 70 Cape species [72 D. T.], closely allied to *Stobaea*, but differing in its acute or taper-pointed pappus scales. The herbs are often thistle-like or small shrubs; leaves rigid, more or less ciliate or spinous-toothed; heads radiate, rarely discoid; involucreal scales in few or many rows, spinous-pointed; achenes mostly silky or pubescent; pappus scales biseriate, acute, serrato-fimbriate or ciliato-serrulate. See *Fl. Cap.*, l.c. 501.

1412 (10) B. stoboeoides Harvey in Harvey & Sond. Fl. Cap. iii.
501, 1864-65.

South Africa—Rhinoster River.

A very distinct species with the habit of a *Stoebe*. Herbaceous, rigid, paniculately branched; stem striate, sub-glabrous, viscidulous; leaves alternate, spreading, half-clasping, pinnatisect with revolute

margins, pungent and spinoso-ciliate, 5-6 cm. long, with lobes 2-2.5 cm. long by 2-4 mm. wide; heads small, corymbose, discoid, few-flowered; bristles of the receptacle half as long as flowers; involucreal scales subulate, longer than disk, with revolute, spinoso-ciliate margins.

First found in Britain at Galashiels, I. M. H., September 1914. See *Rep. B.E.C.* 201, (1915) 1916. At the mouth of the Gala, Selk., and along the Tweed for a mile further on, Roxb. Flowering September to October. Plant robust, somewhat rare. Det. A. Thellung.

336 CARDUUS (Tourn.) L.

A large genus of 100 species [D. T.], native chiefly of the north temperate zone of the Old World, with all the imbricated involucreal bracts spinous; fruit compressed, not angled; pappus hairs rough, not feathery; flowers all tubular; style thickened below the stigma; receptacle densely setose; plants herbaceous, erect, rarely stemless, with alternate, often decurrent, usually spiny, pinnately lobed or sinuate leaves; flowers purple, rose or white.

1425 *C. pycnocephalus* L. Sp. Pl. ed. ii. 1151, 1763.

Jacq. Hort. Vindob. i. 17, t. 54. Reichb. Ic. xv. t. 133, f. 1.

Spain, France, Italy, S. Austria, Adriatic coast, Greece, Turkey, Egypt, N. Africa, Canaries. Adventive in Britain, Syria, Persia, New Zealand—North and South Islands.

Annual, 3-10 dm. or more; stem prickly; leaves oblong, with oblong, angular, prickly toothed lobes; heads crowded, 2-5, pale flowered, sessile at the top of the winged stalk, ovoid-oblong, the inner involucreal bracts shortly acuminate, shorter than the flowers; the corolla limb equalling the tube; achenes viscous. This differs from the British *tenuiflorus* in the larger and fewer heads on longer stalks, the ovoid-oblong not cylindric pericline, and the florets longer in proportion to the scales, but *tenuiflorus* is probably only a sub-species.

First found between Galashiels and Melrose, Roxb., I. M. H., 1908. Flowering August to October.

The British *C. tenuiflorus* Curtis also occurs by the Tweed.

1425 (2) *C. argentatus* L. Mant. ii. 281, 1771.

Jacq. Hort. Vindob. ii. t. 192.

Greece, Cyprus, Palestine, Syria, Asia Minor, Mesopotamia, Egypt—in the deserts between Cairo and Suez.

Annual, 3-5 dm.; stem and branches slender; wings narrow, sinuate-prickly; leaves tender, pinnatifid, prickly; heads solitary, on long, white, naked stalks; middle bracts of involucre lanceolate-subulate, acute, shorter than flowers. The lanceolate, subulate

phyllaries (not longly attenuate) distinguish the plant, which has the aspect of *Tyrinnus leucographicus*, from one-headed forms of *Carduus pycnocephalus*.

First record for Selk.: By the banks of the Gala and a short distance along the Tweed below Galashiels, I. M. H., August 1908. See *Tr. Bot. Soc. Edin.* 41, 1909.

345 CENTAUREA L.

An exceptionally large genus of 500 species so named from *Kentaurion*, the name given by Dioscorides to the Centaury but which is inapplicable to this widely different genus consisting of many showy-flowered annuals, biennials and perennials of wide distribution. It is well represented in the Mediterranean region, the Orient, Caucasus, North Africa and by a few species in America and Australia. It is characterised by heads large and solitary, or smaller and paniculate; flowers purple, blue or yellow; florets tubular; involucre imbricate; style thickened below the stigma; pappus shorter than the fruit; receptacle bearing bristles between the flowers; achenes glabrous; leaves alternate, entire or pinnatifid, rarely prickly.

1452 *C. intybacea* Lam. Enc. i. 671, Août 1785.

France, Spain.

Stem 3-10 dm., frutescent at base; lower leaves stalked, lyrate or pinnatifid, with lanceolate or linear mucronate lobes, median leaves sessile, pinnatipartite, with few, sublinear, pointed lobes, upper linear or narrowly lanceolate; heads solitary, terminal; pericline pubescent at the base, with shining, pale green, striate phyllaries; appendages half-lunate, pale yellow or drab; cilia equal, appressed; florets purple, all tubular; achenes oblong, drab, shining, spotted with brown, pappus as long as achene. If, as is probable, a wool introduction, this must have come with merino wool from Aragon or Murcia. Don's *intybacea* from Forfarshire was doubtless a form of *C. Scabiosa*, and has been named by Williams var. *angusiensis* in his *Prodromus* i. 63.

First record: Tweedside, Kelso, A. Brotherston in *Rep. Bot. Rec. Club* 189, 1876.

1462 *C. Solstitialis* L.

St Barnaby's Thistle.

Syme E. B. v. t. 712.

Widely distributed in Europe—Portugal, Spain, France, Italy, S. Austria, Adriatic coast, Hungary, Serbia, Transylvania, Greece, often adventive there and elsewhere in Europe. Caucasus, Syria, Taurus, Persia, Mesopotamia, Egypt. Adventive in S. Australia—Adelaide (!); New Zealand—North and South Islands; North America—California, especially in alfalfa fields.

Annual, 3-10 dm., canescent; stem winged, especially in the upper part; radical leaves lyrate-pinnatifid, upper narrow-oblong, entire;

flower-heads with no subtending leaves, ovate-ovoid, usually arachnoid, membranous-margined; involucre scales spiny with the terminal spine beset with side spines, the inner ones with no spine but a jagged scarious appendage; florets bright yellow.

First record: Banks of the Tweed near Melrose, Roxb., in two places attaining a height of two feet, Stuart, 1868, in *Proc. Berw.* 78, 1869-72. First record for Selk., I. M. H., in *Tr. Bot. Soc. Edin.* 41, 1909. Near the mouth of the Gala, Selk., thence at various places along the Tweed to Dryburgh, Roxb. Seen frequently and usually of vigorous growth. Flowering August to October. Det. G. C. Druce.

1463 *C. melitensis* L.

Cockspur (Australia).

Reichb. Ic. t. 65, f. 1. Flora Graeca t. 909.

South Europe—Portugal, Spain, France, Italy, Dalmatia, Greece, Malta (from whence the name *melitensis* is derived); N. Africa, Madeira, Canaries, Azores. Adventive in South Africa—Cape Flats; California, South America—Chile, where it is called *Zizana*; Juan Fernandez, Australia—abundant in Queensland, New South Wales, Victoria, Tasmania, South Australia, introduced as far back as 1844. On fallow and pasture lands it forms thick swaths and chokes the more tender, indigenous herbs.

Annual, erect, rigid, 3-7 dm., slightly cobwebby or nearly glabrous; lower leaves pinnately divided; stem leaves narrow, decurrent, entire or slightly toothed, linear-oblong or linear-lanceolate, mucronate; heads small, terminal, sessile above the uppermost leaves, solitary or 2-3 clustered; involucre 13-14 mm.; bracts spiny, the outer ones small with short palmate spines, the middle one a rigid spine, 4-8 mm. with short divaricate spines at base, the inner ones tapering to a very short, simple spine; florets dull yellow; corolla glandular; pappus as long as the achene, of several series of bristles.

First found in Selk. and Roxb., I. M. H., August 1908 in the same localities as *C. Solstitialis* and equally common. See *Tr. Bot. Soc. Edin.* Flowering August to October.

1465 *C. Calcitrapa* L.

Syme E. B. v. t. 711.

Widely spread in Central and S. Europe, extending into Taurus, Syria, India—Punjab, Kashmir, Mysore; Beluchistan, where it is used for camel fodder; Egypt, Sahara, Canaries, Madeira (!). Adventive in North America—New York, New Jersey to Virginia, also in California; New Zealand—North and South Islands; Tasmania.

Biennial, stem not winged, with very spreading or prostrate branches; lower leaves pinnatifid, upper dentate or entire; heads sessile in the forks or within the last leaves of the branches; involucre

ovate-cylindrical, glabrous; bracts ending in a stout, spreading, 2-2.5 cm. spine, longer than the pericline and channelled on the upper side at the base, with two or three short spines near its base on each side, forming a star of prickles, hence the name; florets pale purple-rose; pappus absent.

First record: I. M. H., September 1913, in the vicinity of Galashiels Skin-works, Selk., and along the banks of the Gala and Tweed below Galashiels, Roxb. Flowering September to October. Det. A. Thellung.

1469 *C. napifolia* L.

Flora Graeca t. 905.

Portugal, Spain (rare), Italy, Crete(?), N. Africa. Adventive at Montpellier (*Thellung*).

Annual; leaves of the stem decurrent, subentire, the lower lyrate with obtuse segments; involucreal scales imbricate, semi-orbicular, black-spotted, shortly and finely pectinate, with 5-9 spines; florets purple; achenes pale, puberulent; pappus reddish.

First record: *C. napifolia*, var., Tweedside, Kelso, Roxb., A. Brotherston in *Proc. Berw.* 136, 1873. A specimen in *Herb. Brit. Mus.* from Kelso, Roxb., A. Brotherston, is dated 1875.

346 CNICUS L.

Carbenia Adanson (as *Carbeni*). *Benedicta* Bernh.

A small genus founded on this species, the Greek name, *Knekos*, meaning the *Carthamus*.

1475 *C. benedictus* L.

Blessed Thistle.

Carbenia benedicta Adans. *Benedicta officinalis* Bern. *Centaurea benedicta* L. Flora Graeca t. 906. Reichb. Ic. t. 17.

Portugal, Spain, S. France, Italy, Greece, Turkey, Syria, Transcaucasus, and as a variety in Persia, etc. A species of ancient culture. Often adventive as in North America—Nova Scotia to Maryland, Pennsylvania, Alabama, and on the Pacific Coast, thence probably introduced to Chile, and South Africa—Wittberg.

Annual, the heads heterogamous, the flowers equal; outer florets uniseriate, sterile; the central hermaphrodite, fertile; pericline ovoid-globose; bracts imbricate, the outer oval-lanceolate, leafy, longer than head, appressed, spiny; the inner coriaceous, appressed; appendix spreading, linear, pinnatifid, spined, with a feeble spine at the apex; receptacle flat, densely and longly setose; leaves pale green, slightly coriaceous, with anastomosing, lighter veins and often blotched with silver-white, upper broad, sessile and decurrent; heads large, solitary; flowers yellow.

First record: A little below Galashiels, Selk., Stuart in *Proc. Berw.* 79, 1869-72.

347 **CARTHAMUS** (Tourn.) L.

A widely distributed genus of about 25 [20 D. T.] species, the name being derived from the Arabic *qurṭom*, to paint, from the orange-red dye yielded by the Safflower, *C. tinctorius*, which is largely and widely cultivated in the East. The Levant and the Mediterranean are the head centres for this genus, but examples are found still further east. Some are in East Africa, one in Teneriffe, two in S. Africa, one in the Magellan area, and others in Brazil. It essentially differs from *Centaurea* in the heads having an involucre of small, spiny leaflets which are often fiercely prickly. The plants are thistle-like with alternate, spinose-pinnatifid or spinulose-serrate leaves; the flower-heads terminal or cymose with bright scarlet, yellow, orange-red, whitish or rose-coloured flowers.

1476 **C. lanatus** L.

Kentrophyllum lanatum Lam. *Carduncellus lanatus* Moris.
Carthamus creticus L. Reichb. Ic. t. 746. Flora Graeca t. 841.

Portugal, Spain, France, Switzerland, Italy, Adriatic coast, Hungary, Transylvania, Serbia, Greece, Turkey, S. Russia, Taurus, Caucasus, Persia, Kashmir to 2,000 metres, Egypt, N. Africa, Canaries, Madeira, South Africa—Capetown.

An annual or biennial, 5-15 dm.; stem erect, corymbose, more or less cobwebby; lower leaves lyrate, stem leaves leathery, lanceolate, pinnatifid; heads ovate, 2-3 cm. long; inner involucre scales entire; florets yellow; pappus chaffy.

First found near the junction of the Gala and Tweed, Selk., I. M. H., 1911. Det. J. Hutchinson, Kew.

1477 **C. tinctorius** L.

Safflower, Saffron Thistle.

Flora Graeca t. 746.

Egypt, where it is very largely cultivated, Assyria, Persia, Canaries. Of very ancient cultivation and now frequently adventive in many countries and repeatedly occurring in Britain on rubbish-heaps and about docks, its origin and method of introduction being somewhat uncertain.

A glabrous annual, 3-15 dm.; stem erect, rigid, corymbose; leaves oblong, serrate, prickly; heads terminal, ovate-conical, 3 cm. long, 2.5 cm. broad at base; outer involucre bracts leaf-like, closely imbricated, the inner ending in a rigid, pungent point; florets of a very deep orange-red, all tubular; achenes obovate-tetragonal, truncate; pappus none; receptacle with linear, bristle-like scales. The red florets are used to adulterate the saffron of commerce.

First record for Selk.: I. M. H., October 1910. On a sandy bank near the junction of the Gala and Tweed. Flowering September to October. Det. G. C. Druce.



Fig. 48.

CARTHAMUS DENTATUS Vahl.

1477 (2) C. dentatus Vahl Symb. i. 69, t. 17.*Kentrophyllum dentatum* DC. Flora Graeca t. 840. Fig. 48.

Greece, Macedonia, Turkey, Asia Minor.

This annual or biennial differs from *lanatus* in the much longer pappus. The stem is villous-lanate, erect, corymbose; leaves pubescent-viscid, lower cut in linear-lanceolate, toothed divisions; stem leaves leathery, very strongly nerved, semi-amplexicaul, lanceolate, spinous-dentate, subrecurved; heads large; outer involucreal scales leaf-like, pubescent-viscid, with spines exceeding the head; flowers purple; pappus reddish.

First found in Britain, I. M. H., November 1913. See *Rep. B.E.C.* 18, (1914) 1915. By the banks of the Gala near Galashiels, Selk., one large, striking plant, 15 dm. high, overhanging the water alongside of willows, as depicted in the beautiful photograph. It did not survive the winter. The species has not been observed elsewhere.

354 PICRIS L.

A genus of about 40 [25 Dur.] species, chiefly Mediterranean, N. African and Central Asian, one being found endemic in Japan and two in the Azores. The name comes from *pikros*, bitter. They are coarse, hispid annuals, with yellow flowers and alternate, toothed leaves; the flowers all bisexual, ligulate, fertile for the most part; anthers not tailed; pappus of feathery, whitish, slender bristles.

1488 P. Echioides L.*Ox-tongue.**Helminthia Echioides* Gaertn. Syme E. B. v. t. 798.

Through Central and S. Europe from England to Turkey, Syria, Taurus, Caucasus, Egypt, N. Africa, Canaries, Madeira.

Biennial, with the lower leaves oblong-lanceolate, covered with unequal, white tubercles, from which spring stiff bristles or weak prickles; outer phyllaries 3-5, ovate-acuminate, cordate at base, very large, nearly hiding the inner ones; achenes brick-red, abruptly acuminate and produced into a very long beak the greater part of which breaks off with the deciduous, pure white pappus.

First record, but not as a wool-alien: Lillies Lane, Kelso, Roxb., A. Brotherston in *Rep. Bot. Rec. Club* 45, 1874. Among herbage at the mouth of the Gala, Selk., I. M. H., September 1913. Of frequent occurrence, and probably brought in with wool.

358 HYPOCHOERIS (Vaillant) L.

A genus of about 50 [30 Dur.] species, chiefly represented in South America, but others occur in Europe, N. Asia, etc. Pericline of many unequal, imbricated scales arranged in many series; receptacle with caducous, linear-acuminate, chaffy scales. The name is said to be derived from *hupo*, under, and *choiros*, a pig. Theophrastus used it for a composite species.

1641 *H. glabra* L.

Syme E. B. v. t. 789.

Throughout Europe except the extreme north, Syria, Asia Minor, N. Africa, Canaries, Madeira, Cape Colony—top of Table Mountain, Simonstown (!); Natal.

A small, rosulate annual with glabrous or subglabrous, oblanceolate, sinuate-pinnatifid or dentate leaves; stem slender, erect, slightly branched; flower-stalks slightly thickened upwards; head with few involucre scales, glabrous, longer than florets; achenes beaked or not; pappus-hairs in two rows, the outer shorter and not plumose, the inner plumose.

Recorded for "Tweed" by J. Fraser in *Ann. Scot. Nat. Hist.* 42, 1909, and found by I. M. H. in 1908. Abundant in the vicinity of Galashiels Skin-works, and near the mouth of the Gala, Selk., and by the Tweed between Galashiels and Melrose, Roxb. Flowering August to September. The fruits frequently occur in Australian wool.

365 TRAGOPOGON (Tourn.) L.

Annual herbs with long, narrow leaves, and many-flowered heads; involucre bracts in one row; achenes gradually tapering into a long beak, the marginal tipped with 5 scabrous scales, the central with feathery, interlaced pappus. It consists of about 50 species practically confined to the northern hemisphere of the Old World. The name comes from *tragos*, a goat, and *pogon*, a beard.

1662 *T. orientalis* L.

Reichb. Ic. t. 1390.

France, Germany, Switzerland, Italy, Austria, Hungary, Poland, Transylvania, Herzegovina, S. Russia, Caucasus, Kaputchka up to 2300 m.

Flowers large, 60-65 mm. diameter, longer than the involucre; achenes with a shorter beak than in *pratensis*, and the upper part of the flower-stalk much thickened.

First found at Galashiels, Selk., I. M. H. and G. C. D., August 1913. Flowering August to September. Det. A. Thellung.

365 (2) UROSPERMUM Scopoli Introd. 122, 1777.

A small genus of two South European and Mediterranean species characterised by the campanulate flower-head having 8 connate phyllaries arranged in one row; receptacle convex, not paleaceous, but fibrillosely-pubescent; fruit compressed, muricate-spinous, the fistulous beak dilated at base and separated from the embryo by a diaphragm; pappus hairs all plumose.

1663 (9) *U. picroides* F. W. Schmidt in Samm. Phys. Ausf. i. 276, 1795.

S. European coasts of the Mediterranean, S. W. Asia, N. Africa, Azores.

Annual with simple or branched stems, 3-5 dm., hispid; leaves ciliate, hispid on the surfaces, lower sub-entire, upper more or less pinnatifid, the teeth aristate; heads medium size; peduncles a little dilated; phyllaries ovate-lanceolate, bristly with long hairs; flowers pure bright yellow.

First found in Britain on river shingle at Galashiels, Selk., I. M. H., 1914.

49 CAMPANULACEAE Jussieu.

A large family of about 1000 species [540 Dur.] divided into 60 genera [66 D. T.], practically world-spread, though best represented in the temperate regions of the northern hemisphere, spread through the tropics and present in fair quantity in the temperate region of the south temperate zone. They have little economic importance, and with the exception of *Lobelia inflata*, an asthma remedy, the order, despite the abundance of species having a milky juice, has no great medicinal interest. The name is a diminutive of *campana*, a bell. *Campanula* is one of our most attractive genera of flowering plants. Other garden favourites belong to *Lobelia* and *Cervicina*. They consist of herbs or sub suffruticose plants, usually with blue or white flowers, having a regular, bell-shaped corolla, usually 5-lobed or irregular and split to the base at the back; stamens 5; anthers free or united; ovary 2-5 locular; ovules many on an axile placenta.

366 LOBELIA (Plumier) L.

This genus, named after de L'Obel, a distinguished 16th century botanist, differs from *Campanula* in the irregular 2-lipped corolla and cohering anthers, and consists of herbs, rarely shrubs, of very diverse habit. It contains about 200 species, rare in Europe and W. Asia, but abundant in most other areas.

1665 (3) *L. debilis* L. f. Suppl. 395, 1781.

Monopsis debilis Presl Prod. Lob. ii. 1836. Harvey & Sonder Fl. Cap. iii. 537. Fig. 49.

South Africa—wet places at the Cape, Stellenbosch, etc.

Annual, 5-30 cm., usually branched from base, branches diffuse, filiform; leaves linear, entire, 12-24 mm. long, 1-2 mm. wide, acute; pedicels erect, 2-4 times longer than leaf; calyx-tube obconical; tube of corolla a little longer than calyx; capsule a little curved, acute or attenuated at base; flowers deep blue with yellow anthers.

First found in Britain, I. M. H., August 1913. See *Rep. B.E.C.* 327, (1913) 1914. By the side of the Gala near the Galashiels Skin-works, also along the Tweed near its junction with the



Fig. 49.

LOBELIA DEBILIS L. f.

former stream, Selk. Flowering August to September. Det. A. Thellung.

1665 (4) *L. Erinus* L.

South Africa—stony places on flats and on mountains in Albany, Kaffraria, Natal, etc.

Annual; stem herbaceous, hairy at base; branches filiform, ascending; leaves alternate, lower stalked, obovate, obtuse, dentate or serrate-dentate, middle lanceolate, upper linear, often entire; flowers racemose; corolla blue or violet, glabrous, tube three times longer than calyx; calyx-tube shorter than its acuminate lobes; anthers hairy on the back, the two lower bearded. *Erinus* is a Scrophulariaceous genus which this plant resembles.

First found in Selk., I. M. H., August 1913. Among grassy herbage by the side of the Tweed, one mile below Galashiels. Flowering August to September. Named at the Natural History Museum, South Kensington.

371 *LEGOUSIA* Durande Fl. Bourg. i. 37, 1782.

Specularia A. DC. Mon. Camp. 344, 1830.

A small genus of about 12 species found in temperate climes—Europe, Asia, North and South America, chiefly differing from *Campanula* in the very long and slender capsule dehiscing from the sides below the calyx lobes.

1678 (2) *L. biflora* (R. & P.) Britton in Mem. Torr. Club v. 309, 1894.

Specularia biflora Fisch & Mey. Ind. Sem. Hort. Petrop. i. 17.
Campanula biflora Ruiz & Pav. Fl. Peruv. ii. 55, t. 200, f. 6, 1799.

In dry soil, Virginia to Tennessee, Kansas, Florida, Texas, California, South America.

Glabrous or nearly so; stem very slender, simple or branched, roughish at angles, 1.5-6 dm.; leaves ovate, oblong, sessile, stem-clasping; flowers with 3-5 ovate to lanceolate calyx-lobes; capsule oblong-cylindrical opening by valves close under the calyx-teeth. See Britton & Brown *Ill. Fl. North. U.S.*, etc., iii. 256.

First found on Tweedside, I. M. H., in flower September 1916, on the banks of the Gala below Galashiels, Selk. Det. A. Thellung.

54 PRIMULACEAE (Ventenat) L.

A family of about 21 genera [28 D. T.] and 250 species [352 D. T.] of very varied habit, mostly herbaceous, a few suffruticose, chiefly occurring in the northern hemisphere, a few in the southern, but in the tropics practically confined to the mountain ranges. The flowers

are regular, hypogynous; stamens as many as and opposite to the corolla lobes; ovary 1-locular; placentation free-central. The order is lacking in plants of economic value, but the *Primulas* are among the most favoured garden plants, while *Androsace*, *Lysimachia* and *Cyclamen* also afford many species of value to the horticulturist. In *Samolus* it has one of the most widely diffused plants.

398 ANAGALLIS (Tourn.) L.

A small, widely dispersed genus of about 12 species, one, *A. arvensis*, being connected with corn-culture throughout the temperate areas. The plants consist of annuals or perennials with regular, blue or scarlet or pink flowers; corolla rotate or campanulate, deeply 5-lobed; calyx free, deeply 5-cleft, not spiny; capsule superior, opening by a fissure across the middle. *Anagallis* is the Greek name.

1742 A. femina Miller Gard. Dict. 1768. *Blue Pimpernel.*
A. caerulea Schreber. Syme E. B. vii. t. 1146.

In light soils practically throughout Europe but commoner in the south.

A small, diffuse species with quadrangular stem and rotate corolla of bright blue flowers, the segments usually free from gland-tipped cilia.

First record for Selk. and Roxb.: I. M. H., August 1912. Found by the side of the Gala near Galashiels Skin-works, Selk., also along the Tweed two miles below Galashiels, Roxb. Flowering July to October.

58 POLEMONIACEAE Jussieu.

A family of about 200 species and 9 genera, mostly glabrous or viscid, exstipulate, erect or twining herbs, rarely shrubs, with hermaphrodite flowers; calyx free, deeply 5-cleft, persistent; corolla hypogynous; stamens 5, adnate to the corolla tube; gynoecium consisting of a solitary 3-locular ovary; ovules solitary; fruit dehiscent loculicidally. The family contains no species of economic importance, but *Phlox*, *Polemonium*, *Gilia* and *Collomia* are bright-coloured garden plants. It is best represented in North America, especially in California and Mexico, and in the South American Andes, but examples are elsewhere widely spread. Pliny says that the plant which he called by this name was the cause of a war between two kings who each claimed to have discovered its virtues.

413 GILIA Ruiz & Pavon Fl. Peruv. 25, 1794.

A polymorphic genus of about 70 species belonging almost entirely to the country west of the Mississippi, a few appearing in extra-tropical South America, consisting of herbs or suffrutescent plants, many with showy flowers, having a regular corolla; stamens inserted

on the throat or on the tube of the corolla, the filaments not declined ; seeds wingless, mucilaginous when wet, and in many cases with uncoiling spiral threads.

1776 (2) *G. pungens* Dougl. ex Hook. & Arn. in Bot. Mag. t. 2977.

Navaretia pungens Benth. in DC. Prod. ix. 316, 1845. *Cantua pungens* Torrey Ann. Lyc. N. Y. ii. 221. *Phlox Hookeri* Douglas in Hook. Fl. Bor.-Amer. t. 159.

High and dry parts of the Sierra Nevada—common above the Yosemite Valley, and through the interior of Oregon to the Rocky Mountains (*Geol. Surv. Calif.* i. 492), Colorado, Wyoming, British Columbia, where D. Douglas discovered it on moist ground near the source of the Multnomah river.

Plant 2-3 dm. high, bushy, more or less viscid-pubescent or nearly glabrous, rigid ; leaves spreading or erect, alternate, palmately cut, crowded on the woody stems, fragrant in drying ; corolla white or rose-coloured, the 5 lobes narrow and short ; anthers borne in the throat ; ovules 8-10 in each loculus ; seeds not becoming mucilaginous when steeped in water.

First found in Britain, I. M. H., August 1915. See *Rep. B.E.C.* 203, (1915) 1916. On shingle by the side of the Gala within the burgh of Galashiels, Selk. Flowering July to August. Det. A. Thellung.

59 HYDROPHYLLACEAE Lindley.

A family of about 130 species [167 D. T.] divided into 17 genera limited to the American continent, and with the exception of a few *Hydroleas* confined to North America, where in California they reach their maximum of representation. They are of no commercial or medicinal value, but some have very showy flowers. One at least of the *Phacelias* is a great favourite of bee-keepers, and *Nemophila* is a familiar and pleasing garden plant. The one-sided cymes bear a very close resemblance to the *Boraginaceae*, of which they often have the rough hairiness, but differ in the single and entire ovary. In *Boraginaceae* the ovary is 4-lobed, forming four separate or separable seed-like nutlets. The styles are 2 or 1 ; capsule 2-cleft, 1-2 seeded. The name is derived from *hydor*, water, and *phyllon*, a leaf, from the very juicy spring leaves.

415 PHACELIA Juss. Gen. 129, 1789.

This genus of about 50 [70-80 D. T.] North American species with two or three from Mexico and Chile, so named from *phakelos*, a fascicle, is characterised by the corolla being imbricate in bud ; leaves, all but the lowest, alternate ; style from 2-cleft at the apex to 2-parted ; calyx of 5 similar or slightly dissimilar divisions ; stamens inserted low down ; flowers blue or white, not yellow, clustered, spiked or racemed in scorpioid cymes.

1780 (2) *P. circinata* Jacq. f. *Eclog. Amer. i.* 135, 1816.

P. heterophylla Pursh. *P. californica* Chamisso.

Very common in dry rocky ground from California north to British Columbia, east to and beyond the Rocky Mountains and south into Mexico—Orizaba; Chile, Peru and Patagonia.

Perennial or biennial, 3 to 6 dm., hispid, the foliage strigose, either greyish-green or canescent; leaves varying from lanceolate to ovate, acute, obliquely and simply straight-veined, the lower narrowing into a stalk with commonly one or two pairs of lateral leaflets; inflorescence hispid; spikes thyrsoïd, crowded: corolla whitish or bluish, moderately 5-lobed, longer than the linear or oblong-lanceolate calyx-lobes; filaments much exserted, sparingly bearded. A. Gray, *l.c.*

First found in Britain, I. M. H., July 1912. See *Rep. B.E.C.* 167, (1912) 1913. By the banks of the Tweed between Galashiels and Melrose, Roxb. Flowering July to September. Det. A. Thellung.

60 BORAGINACEAE Lindley.

Ehretiaceae Schrader, 1820. *Asperifoliaceae* Reichb.

A large family consisting of about 1200 species and about 80 [95 D. T.] genera, the herbaceous species most plentiful in the northern hemisphere, especially in S. Europe and W. Asia, the shrubby and arborescent species, with drupaceous fruit, chiefly in the tropics. They have very little economic value. A dye, alkanet, is yielded by one of the species, and the Comfrey has reputed medicinal properties. Our gardens are enriched by many beautiful species belonging to it, such as *Myosotis*, *Echium*, *Anchusa*, *Cerinthe*, *Borago*, *Cynoglossum*, *Lithospermum*, *Heliotropium*, etc. They are roughish, pubescent herbs or more rarely shrubs or trees, with usually alternate, exstipulate leaves; scorpioid inflorescence; pentamerous flowers; fruit 2-4 locular with central placenta; usually 4 one-seeded nutlets and single style.

419 LAPPULA (Rivinus) Moench *Meth.* 416, 1794.

Echinosperrnum Swartz in *Lehm. Asp.* 113, 1818.

A genus of about 50 species of small, pale blue or rarely white-flowered herbs, abundant in Central and Northern Asia, a few reaching Europe. One has spread as a weed over a large area of North America and Australia. The plants are annuals or biennials with scorpioid inflorescence; flowers small in partly bracted racemes or spikes; nutlets naked in the base of the equal and unchanged calyx and fixed by some part of their inner angle or face, either next the base or higher up to the gynobase, glochidiate or otherwise armed or prickly, forming "burrs" which stick in the hair of cattle or sheep.

- 1787** *L. echinata* Gilib. Fl. Lithuan. } *European Stick-seed* (U.S.A.).
i. 25.

L. Lappula Karst. *Echinospermum Lappula* Lehm.

Britton & Brown Ill. Fl. North. U.S., etc., iii. 54, f. 3021.

Throughout Europe (except Greece and Turkey), Anatolia, Armenia, Taurus, Caucasus, Persia, Beluchistan. Adventive in Natal, North America—from Nova Scotia to British Columbia south to New Jersey and Nebraska.

Annual or biennial, 2-4 dm., whitish from the strong hairs, divided at the top into fastigiate branches; flowers small, pale turquoise-blue, extra axillary, bracteate, the fruiting pedicels short, erect; nutlets trigonous, drab, tuberculate on both sides and bristly on the lateral angles with distinct, not confluent, glochidiate spines arranged in 2 rows.

First record: *Echinospermum Lappula*, mouth of the Gala, Selk., A. Brotherston in *Proc. Berw.* 136, 1873. Found by I. M. H. by the side of the Tweed near Dryburgh, Roxb., also along the banks of the Gala, near the mouth of that stream, Selk., 35 years later than its original record, also just below the bridge at Peebles. Flowering August to September.

- 419 (3) ERITRICHIMUM** Schrader in Comm. Hort. Gott.
iv. 186 in Obs. 1820 (as *Eritrichum*).

A genus numbering about 50 species [30 D. T., 70 Dur.], dispersed over the temperate and mountainous regions of Europe and Asia and in America descending from Rupert's Land along the line of the Andes to Chile. It is closely allied to *Myosotis* and *Lappula*, with the same habit and flower, the fruit having intermediate characters, the receptacle more prominent than in *Myosotis*, much less so than in *Lappula*, the unarmed nutlets neither smooth and shining as in *Myosotis* nor muricate as in *Lappula*. The name is derived from *erion*, wool, and *thrix*, hair.

- 1789 (7) E. australasicum** A. DC. Prod. x. 134, 1846.

Benth. Fl. Austral. iv. 406, 1869. Fig. 50.

Australasia: Victoria—Wimmera, Skipton (?); South Australia—pastures at Rocky Creek; West Australia.

Calyx deeply divided into 5 segments; corolla with a cylindric tube, throat with 5 minute gibbosities or scales or quite naked, limb spreading, 5-lobed; stamens inserted in the tube, anthers included; ovary 4-lobed; style filiform, inserted between the lobes, with a small, usually capitate stigma; nuts 4, rugose or reticulate, crest attached to the shortly pyramidal or convex receptacle by an oblique areole, the inner angle prominent; seeds without albumen; radicle short. See Benth. *Fl. Austral.* iv. 406.

This small annual was first found in Europe by I. M. H., 1909. See *Rep. B.E.C.* 416, (1909) 1910. One small patch of this endemic



Fig. 50.

ERITRICHIMUM AUSTRALASICUM A. DC.

Australasian species was found in the moist alluvium near the junction of the Tweed and Gala, Selk., and noticed from 1909 to 1916. An undoubted wool alien. Flowering July to October. Exhibited at the Linnean Society December 1, 1910. Det. G. C. Druce.

430 *ECHIU*M (Tourn.) L.

A striking genus of about 50 species [viz 20 Dur.] of usually bristly annuals, biennials or perennials, scattered throughout Europe, W.

Asia and N. Africa and also as some handsome shrubby types in Madeira, Canaries and Azores. They are characterised by the irregular corolla with the throat usually naked; nutlets inserted by flat bases on the flat receptacle; stamens exserted; flowers white, red-purple, violet or blue, in spiked or paniced racemes. Several are ornamental plants in the garden, and a Madeiran species is "the Pride of the Island." *Echium* is said to be derived from *echion*, the name given to one of its species by Dioscorides.

1827 *E. plantagineum* L.

Syme E. B. vi. t. 1096. Flora Graeca t. 179.

S. Europe—France, Spain, Portugal, Italy, Adriatic coast, Greece, Turkey; Syria, Asia Minor, Palestine, N. Africa, Madeira, Canaries. Adventive in New Zealand.

Herbaceous, 2-13 dm., with elliptic-oval lower leaves, bristly with spreading hairs seated on small tubercles; flowers all bracteate, very handsome, purplish-blue or violet-purple, 2.5-3.5 cm. long, the tube suddenly and greatly enlarged upwards.

First found on Tweedside, I. M. H., October 1913. Among herbage by the side of the Tweed near its junction with the Gala, Selk. Strong plants flowering in October.

62. SOLANACEAE [Haller] Pers.

A large and important family of about 1500 species and 83 genera [D. T., 73 Dur.], extremely abundant in tropical and extra-tropical South America, and absent only from arctic, antarctic and alpine regions. It belongs to the Gamopetalae and is distinguished by the regular or sub-regular corolla with 5 stamens often cohering, alternate with the lobes; ovary superior with 2 or more loculi; ovules many, axile; fruit baccate or drupaceous. The order contains numerous poisonous species, those of great medicinal value including *Atropa Belladonna*, *Hyoscyamus niger* and *muticus*, *Datura Stramonium* and *Tatula*, *Scopolia* and *Nicotiana*, the latter covering the world with its fumes. Edible species are *Lycopersicon*—the Tomato, various species of *Physalis*, as the Cape Gooseberry; the Potato, the Aubergine and the fiery *Capsicum*. The *Mandragora* of the Greeks also belongs to this interesting order, which includes such striking garden plants as *Petunia*, *Nierembergia*, *Cestrum*, *Fabiana*, *Schizanthus* and *Salpiglossis*.

437 SOLANUM (Tourn.) L.

An immense and critical genus of which nearly 1200 species have been named. It consists of spiny or unarmed, herbaceous, fruticose or arborescent plants, especially abundant in South America and frequent in the central and north-western side of the same continent. The characters are mainly the ovary with 2 (rarely 3) locules; the baccate fruit; the anthers with (usually) porous dehiscence and the

rotate corolla. It contains many handsome species and includes that important economic vegetable, *Solanum tuberosum*, the potato, the less valuable *S. Melongena*, while feeble medicinal value is said to belong to our indigenous *S. Dulcamara*.

1846 *S. nigrum* L.

Syme E. B. vi. t. 931.

A cosmopolitan species, but only a weed in Scotland, extending over Europe and Asia to Japan; the northern United States, South America, Canaries, Australia, New Zealand. The berries are eaten in Beluchistan.

An annual herb with angular stem, more or less pubescent, very variable in habit, sometimes erect, at other times rampantly prostrate, up to 6 dm.; leaves ovate, obovate or lanceolate, sinuate-dentate or sub-entire, narrowing into the leaf-stalk; flowers small, rotate, about 5 mm. across, the lobes oblong-lanceolate, acute, borne on few-flowered, umbellate cymes; berries globose, green, eventually black. A polymorphic plant probably including several species.

First record: Banks of the Tweed, not far from Melrose, Roxb., and on the Gala near Galashiels, Selk., Stuart in *Proc. Berw.* 78, 1869. Observed by I. M. H. along the banks of the Gala, Selk., also at various places by the Tweed between Galashiels and Dryburgh. Abundant. Flowering July to October.

Var. HUMILE (Bernh. in Willd. Enum. Hort. Berol. 236) is a shorter and more diffuse plant with yellowish-green fruits.

First found in Scotland, I. M. H., October 1914. See *Rep. B.E.C.* 203, (1914) 1915 by the side of the Tweed near Dryburgh, Roxb., fruiting freely, but not of frequent occurrence. Flowering August to October.

1847 (2) *S. Commersonii* Dunal ex Poir. Enc. Suppl. iii. 746.

Geographical area: Argentina.

Plant spineless; leaves unequal at base, interruptedly pinnatifid, pilose; inflorescence corymbose; corolla 5-angled; root tuberous.

First found in Britain, I. M. H., September 1915. See *Rep. B.E.C.* 203, (1915) 1916. On marshy soil at the junction of the Gala and Tweed, Selk. Flowering August to September.

438 *PHYSALIS* L.

A genus of about 45 species [30 Dur.] well represented in South and Central America, and indeed mainly belonging to the western hemisphere, consisting of annual or perennial herbs, noticeable for their accrescent, often bright-coloured, membranous and veiny calyx, which grows round and encloses the fruit, which is a 2-locular, juicy berry, often edible. One of the species is the Cape Gooseberry. The corolla is rotate or with an open campanulate base, 5-angled or



Fig. 51.

PHYSALIS IXOCARPA Brot.

obscurely lobed, the anthers distinct, opening lengthwise, without pores. The Winter-Cherry of our gardens is a well-known plant. The name is derived from *physalis*, a bladder, in allusion to the inflated calyx.

1851 (3) *P. ixocarpa* Brot. in Hornem. Hort. Upsala Suppl. 26, 1819.

P. aequata Jacq. f. ex Nees in Linnaea vi. 470, 1831. Fig. 51.
Britton & Brown Ill. Fl. North. U.S., etc., iii. 128, f. 3196.

Mexico. Adventive and often cultivated for its fruit in the United States.

Annual, green, almost glabrous, 3-8 dm., widely spreading; leaves thin and soft, ovate or oblong, sinuate, toothed or repand; pedicels very short; corolla about 1 cm. diameter, greenish-yellow with a purple throat; anthers tinged with dark blue; fruiting calyx large, ovate-globose, little angled when mature; fruit purple, which sometimes bursts the calyx.

First found in Britain, I. M. H., October 1915. See *Rep. B.E.C.* 203, (1915) 1916. Plentifully on the banks of the Gala, Selk., and Tweed from Galashiels to Dryburgh, Roxb. Plants of a strong growth, flowering September to October and fruiting freely. Det. A. Thellung.

Dr Thellung also refers to *P. ixocarpa*, the plant recorded as *P. angulata* in *Rep. B.E.C.* 18, 1914. G. C. Druce has also found *ixocarpa* in 1917 at Abingdon, Berks., near a fell-monger's yard.

1851 (4) *P. pubescens* L. *Low hairy Ground-Cherry.*

P. barbadensis Jacq. Ic. Rar. t. 39. Fig. 52.

Britton & Brown Ill. Fl. North. U.S., etc., iii. 126, f. 3190.

Common in the Atlantic States, thence west to California; Central America—Mexico, Colon (!); Barbadoes (!) a weed, Martinique, South America—Brazil, etc.

Annual, stem pubescent with viscid, spreading, soft hairs; leaves ovate or sub-cordate, pointed, toothed, sinuate or sub-entire; calyx-lobes lanceolate acuminate; bladder 5-angular; corolla 6-8 mm. diameter, yellow, purple-spotted within; anthers violet.

First found in Britain, I. M. H., October 1915. See *Rep. B.E.C.* 203, (1915) 1916. By the Gala in the vicinity of Galashiels Skin-works, Selk. Neither so abundant nor so robust as *P. ixocarpa*. Flowering September to October. Det. A. Thellung.

439 NICANDRA Adans. Fam. ii. 219, 1763.

A monotypic genus named after Nicander of Colophon (circa 150 B.C.). A well-known garden plant, native of Peru.

1852 *N. physaloides* Gaertn. Fruct. ii. 237, t. 131, f. 2, 1789.

Bot. Mag. t. 2458. Fig. 53.



Fig. 52.

PHYSALIS PUBESCENS L.

Peru, etc. Adventive in North America, Natal, Canaries, Madeira, Egypt, many places in Europe, India—from Kashmir to Sikkim, Deccan; New Zealand.

Plant 6-12 dm.; leaves stalked, membranous, sinuate-dentate or slightly lobed; calyx 5-angled, inflated; fruit fleshy, 3-5-locular, enclosed in the rather large calyx; corolla blue, rather large, extra axillary, solitary, pendulous.

First record for Selk. and Roxb.: I. M. H., October 1915. In the vicinity of Galashiels Skin-works, Selk., also by the side of the Tweed two miles below Galashiels, Roxb. Flowering October to November. Det. A. Thellung.

442 DATURA L.

A small genus of about 15 species widely dispersed through the warmer and temperate regions of the world. The fruit is a capsule, often fleshy, sometimes prickly, with a deciduous calyx, leaving a short base under the fruit; corolla convolute, as well as plaited, in bud. It consists of herbs and shrubs while some assume tree-like proportions. Some of the species are highly ornamental.

1855 D. Stramonium L. *Thorn Apple, Jimson Weed* (U.S.A.),
Chamico (Chile).

Syme E B. vi. t. 935. Bailey & Gordon's Poisonous Plants, t. 55.

Cosmopolitan. As a weed in Middle and South Europe, W. Asia, widely spread in the Caspian area, India—from Kashmir to Sikkim, Beluchistan, Egypt, Canaries, abundant in some parts of the United States, Queensland, New Zealand. The native country of *Datura Stramonium* has been the subject of much controversy. Thellung, following Schleiden, Schoenfeld, and others, thinks it was introduced into Europe by gipsies from the East; De Candolle thought it came from the Caspian area; and Dunal considered it to be a native of North America, but this view has received no recent support. The fact remains that it was introduced into gardens in England as early at least as 1590, and that it occurred spontaneously at Montpellier in 1762. The seeds have for many ages been used as a poison in the East, and the plant is very common in India. It also grows about many of the settlements of East Indians in the West Indian Islands, at Colon, etc., and Natal.

A robust, erect annual, 2-10 dm.; stem round, dichotomously branched in the upper part; leaves glabrous, flaccid, ovate, more or less coarsely toothed and lobed, up to 18 cm. long and 6½ cm. broad, acuminate, unequal at base; flowers and fruit erect in the forks of the branches; corolla white, 6-8 cm. long, plicate in bud, trumpet-shaped, 5-lobed, the lobes spreading or recurved; fruit very spiny, erect, ovoid, 5 cm. long; seeds black, reniform.

First record for Tweedside: I. M. H., August 1909. Along the Gala between Galashiels Skin-works and the junction with the Tweed,



Fig. 53.

NICANDRA PHYSALOIDES Gaertn.

Selk., thence along the Tweed to Melrose, Roxb., found in successive years. Large handsome plants growing very abundantly and flowering August to October.

Var. TATULA (L.). Var. *chalybaea* Koch Syn. 510, 1837.

This differs from the type mainly in the dull purplish-violet flowers. Like *Stramonium* it is largely used as a remedy for asthma.

Found by I. M. H. abundantly in the same localities as the type.

Possibly both this and the variety owe their presence on the Tweed to other causes besides wool-cleaning, as they are not infrequently cultivated, but seeds have been found in Australian wool.

444 NICOTIANA L.

A genus of about 50 [40 D.T.] species named after Jean Nicot, of Nismes in Languedoc, who introduced Tobacco into France. He was agent of the King of France in Portugal about 1580. The plants are herbaceous, suffruticose or tree-like shrubs, mostly natives of America, but others are natives of Australasia and the Pacific Islands. They are rarely glabrous, but usually clammy, heavy-scented, viscidly-pubescent and poisonous plants with mostly entire leaves and paniculate or racemose, often showy flowers, white, yellowish, purplish or greenish; the calyx 5-cleft; the corolla salver or funnel-shaped, sometimes with a very long tube, the limb 5-lobed; the capsule smooth with 2 (rarely more) locules, splitting at the apex into as many valves, and these 2-cleft. In *Petunia* the capsule is simply 2-valved.

1859 (2) *N. suaveolens* Lehm. Gen. Nicot. 43, 1818.

N. undulata Vent. Jard. Malmais. i. t. 10, 1803, not of Ruiz and Pavon.

Sims Bot. Mag. t. 673, 1803. Jacq. Fragm. Bot. 45, f. 56, 1809.

Australasia: N. Australia—N.W. coast; Queensland—Rockhampton, etc., and in the interior; New South Wales—Port Jackson to the Blue Mountains, etc.; Victoria—Port Phillip, Murray River, near Ballarat; South Australia—Murray River, Torrens River, head of Spencer Gulf; West Australia—Murchison and Blackwood Rivers.

An erect, more or less pubescent or villous, usually viscid annual or biennial, 7-8 dm.; lower leaves on long stalks, ovate-lanceolate, very variable, undulate; flowers large, pure white, sweet-scented, especially at night, in loose, terminal racemes, often branching into irregular panicles; corolla tube cylindric, from 1.25 to 5 cm. long, usually slightly swollen under the throat, limb spreading, flat, the lobe short and broad, emarginate or almost acute.

First found in Britain, I. M. H., September 1911. See *Rep. B.E.C.* 25, (1911) 1912. Rarely on shingle in the bed of the Gala within the burgh of Galashiels. Flowering August to September. Exhibited at the Linnean Society April 2, 1914. Named at Kew.

Nicotiana suaveolens, the native tobacco of Australia, is the only endemic species and proves a troublesome weed in the stock country. It is sometimes spoken of as a good fodder plant, at other times it is said to be poisonous. Dr J. M. Petrie (*Linn. Soc. New South Wales*, April 26, 1916) had plants from three different localities in the colony analysed, and found the percentage of nicotine in them to be 0.035, 0.003 and 0.004 in the fresh plants or 1.124, 0.011 and 0.015 in plants dried at 100°. It was calculated from the lowest figure stated that enough alkaloid is contained in half a pound of green plant to poison an ordinary sized sheep.

63 SCROPHULARIACEAE Lindley.

A considerable and variable family of about 2300 species and 200 [166 Dur.] genera, world-spread, but most common in temperate regions, consisting chiefly of herbaceous annuals, biennials or perennials, but a few are shrubby and arborescent species, glabrous, variously pubescent or glandular-viscous. Several genera are semi-parasitic. The plants possess little economic value. The Foxglove is one of the few species used in medicine. It has powerful poisonous qualities, and has proved a valuable remedy in certain cardiac troubles. Many of the species are beautiful garden plants—*Calceolaria*, *Antirrhinum*, *Penstemon*, *Mimulus*, *Veronica*, *Linaria*, *Chelone* and *Verbascum* are examples. The species are characterised by the irregular, often bilabiate flowers (except *Verbascum*, etc.); 4 fertile stamens, didynamous; capsular fruit, 2-locular, with central placentation containing few or many seeds.

447 CALCEOLARIA L. Mant. ii. 143, 1771.

This genus—the name badly constructed from *calceolus*, a little slipper—consists of about 150 Central, South American and New Zealand species. They are often ornamental herbs or small shrubs and are remarkable for their short tubed, bilabiate corolla with very large concave lower lip.

1872 (3) *C. mexicana* Benth. Pl. Hartweg. 47.

In mountainous parts of Mexico—Anganguco, Orizaba, Mount Oaxacanis.

Annual; stem viscidly-pubescent; leaves stalked, inciso-pinnatifid, pubescent with small hairs above, pale and glabrous beneath; corolla upper lip shorter than calyx, lower porrect, obovate-orbicular; staminal filament almost absent, the connective linear-elongate.

First record for Selk.: I. M. H., August 1914. Rare on shingle in the bed of the Gala, within the burgh of Galashiels. Flowering August to September. Det. I. M. Hayward.

454 LIMOSELLA L.

Small, tufted, creeping, glabrous, aquatic herbs, with minute, ebracteate, axillary, solitary flowers; corolla nearly regular, 5-cleft; stamens 4, anthers confluent; calyx 5-toothed, campanulate. The name is derived from *limus*, mud, in which they delight to grow. The species number about 7, one being spread over the temperate regions of the world, two in South Africa, and one in Australasia.

1901 *L. aquatica* L., var. *tenuifolia* Hook. f. Fl. N. Zeal. i. 190.

L. tenuifolia Wolf. ex Hoffm. Deutsch. Fl. ed. 2, i., ii. 29, 1804.

The type occurs in Britain, Scandinavia, N. Spain, France, Belgium, Holland, Germany, Switzerland, N. Italy, Austria, Hungary, Herzegovina, Serbia, Transylvania, Russia, Egypt. The variety occurs at Kenfig Pool, Glamorgan and elsewhere in Europe, and is common in wet places throughout both the islands of New Zealand and Australia, Tasmania, temperate North and South America, and South Africa, where the type is rare.

First found in Scotland, I. M. H., October 1911. See *Rep. B.E.C.* 54, (1911) 1912. Both type and variety occur by the banks of the Gala below Galashiels Skin-works, Selk. Flowering September to October. Det. G. C. Druce.

458 VERONICA (Tourn.) L.

A large genus of nearly 200 herbaceous species—in the Antipodes shrubby or even arborescent—often very ornamental, with flowers blue, purple, flesh-coloured or white, often varying in colour in the same species, but never yellow; corolla rotate or sub-campanulate, the limb 4, rarely 5-fid, spreading, the lateral lobes usually narrower, the tube rarely exceeding the calyx; stamens 2, exserted. The annual species are among the commonest corn weeds, and the genus itself is widely distributed in the temperate regions but thins out in the tropics. It is especially abundant and ornamental in New Zealand. Named after St. Veronica.

1927 *V. peregrina* L.

Britton & Brown Ill. Fl. North. U.S., etc., iii. 169, f. 3294.

North America—moist places from Nova Scotia to British Columbia, south to Florida, Mexico and California; Central America; South America in Chile—Cordilleras de Santiago, Valdivia; naturalised in Europe.

A small, low growing annual, with the upper leaves alternate, minutely pubescent or glabrous; leaves rather succulent, mostly linear-oblong, obtuse, the lower often toothed, the upper entire and narrower and diminishing, but all longer than the very short-stalked, axillary flowers; corolla inconspicuous; capsule rounded-obcordate, many-seeded.

This species was first noticed in the United Kingdom at Strabane in Ireland in 1836. As a garden weed at Newtonden, Berwickshire,

1874, *Rep. Bot. Rec. Club*. Found by I. M. H. at Galashiels on the banks of the Gala at its junction with the Tweed, Selk., August 1913. Flowering July to August. Det. A. Thellung. It is a pestilent weed in some nursery gardens in England.

68 LAMIACEAE Lindley.

Labiatae B. Jussieu.

A large, important and very natural family of nearly 3000 species of herbs and shrubs, divided into about 150 genera spread over all warm and temperate regions, but thinning out in the arctic and antarctic areas and rare in alpine situations. They are often very aromatic and the leaves of many species such as the Mints, Lavender, Rosemary, Patchouli and Marjoram contain valuable essential oils of medicinal or economic value. They are often of very attractive appearance and have long been garden favourites. Among these are *Salvia*, *Coleus*, *Hyssopus*, *Monarda*, *Phlomis*, etc. The family, which is allied to Verbenaceae and Boraginaceae, has the leaves opposite or in whorls, without stipules; flowers in opposite cymes; calyx 5-cleft or 2-lipped; corolla 2-lipped (generally); stamens 2-4, didynamous; carpels 2-ovuled; fruits 1-4 of 1-seeded nutlets. The rarity of the Lamiaceae—indeed their practical absence as wool-aliens is remarkable, as fruits of *Micromeria*, *Thymus*, etc., have been seen attached to sheep's wool in Greece, etc. Either the seeds get shaken out, or, as is more probable, the plants require warmer and drier conditions than Tweedside offers.

488 MARRUBIUM (Tourn.) L.

A genus of about 40 perennial, usually cottony or tomentose species, inhabitants of S. Europe and W. Asia, the name being the Latin word used for the Horehound by Pliny. It is characterised by the tubular, 5-10-nerved calyx with as many teeth, usually spreading when mature; corolla short, with a ring of hairs inside or naked; anthers all fertile.

2049 *M. vulgare* L.

White Horehound.

Syme E. B. vii. t. 1064.

Throughout Europe except the extreme north but often adventive; W., S.W., and Central Asia, N. Africa, Canaries. Naturalised in North and South America and Australia.

Perennial, 3-5 dm.; stems numerous, leafy; leaves stalked, ovate-orbicular, irregularly crenate, leathery, much wrinkled, somewhat tomentose below, odour strong; flowers small, white, hairy, in dense, sessile whorls; calyx tomentose.

First found on Tweedside, Selk., I. M. H., August 1910. Although probably a native of southern England it is certainly adventive in Scotland, and at Galashiels owes its presence to the wool industry since its seeds are found in Tasmanian and Australian

wool. It has been naturalised in Australasia for the past half century and was probably introduced to that island continent with merino sheep. Thus, these Tweedside specimens are descendants of South European plants after a very lengthy journey.

69 PLANTAGINACEAE Lindley.

A small, unattractive family of about 200 species divided into 3 genera, which are spread through the temperate regions of the globe, consisting of annual or perennial herbs with flowers in heads or spikes, rarely solitary; leaves often rosulate or basal; flowers 4-merous; corolla inconspicuous, scarious; stamens 2-4; capsule 2-locular, 2 to few-seeded, circumscissile. *Plantago* is the Latin name of the Plantain.

499 PLANTAGO (Tourn.) L.

A genus of over 200 terrestrial species, with spiked, two-sexual flowers.

2100 *P. virginica* L.

Britton & Brown Ill. Fl. North. U.S., etc., iii. 210, f. 3388.

In dry soil, Connecticut to Florida, west to Illinois, Missouri, Arizona; N. Mexico, and as a large striking variety in California.

Annual or biennial, pubescent, caulescent; corolla lobes erect and closed over the top of the fruit (pyxis); leaves spatulate to obovate, thin, 3-5-nerved; stamens 4.

First record as a wool introduction: Galashiels, Selk., A. Brotherston, 1873, in *Rep. Bot. Rec. Club*, 1874. Also near the mouth of the Gala, A. Brotherston in *Proc. Berw.* 136, 1873. It was noticed by Godron at Port Juvenal in 1853.

2100 (2) *P. varia* R. Br. Prod. 424, 1810.

Benth. Fl. Austral. v. 139.

Australasia: Victoria—Port Phillip, near Melbourne, etc.; Tasmania—abundant everywhere in the colony; South Australia; West Australia; in both islands of New Zealand, but adventive.

A perennial, often flowering the first year, forming ultimately a thick root-stock with the membranous, dilated, imbricate bases of the leaves enveloped in long, reddish-brown, woolly or silky hairs; leaves all radical, erect or rosulate, lanceolate or linear-lanceolate, entire or feebly toothed, with 1, 3 or 5 nerves, contracted into a long stalk, more or less hirsute; flower-stalks longer than leaves, bearing a rather dense or more or less interrupted spike, from 2.5-10 cm. long, more or less appressedly hirsute; calyx sessile within a bract rather shorter and narrower than the sepals and but slightly scarious on the margin; sepals all free, obtuse, with broad scarious margins; corolla tube about as long as calyx, lobes ovate, much imbricated in bud; ovary 2-locular with 2 collateral ovules in each locus. See Benth. *Fl. Austral.* v. 139.

First found in Britain, I. M. H., September 1911. See *Rep. B.E.C.* 29, (1911) 1912. Abundantly by the banks of the Gala, Selk., and along the Tweed between Galashiels and Melrose, Roxb. Flowering September to October. Exhibited at the Linnean Society April 2, 1914. Named at Kew.

70 ILLECEBRACEAE Lindley.

A small, unattractive family of about 90 species spread over the globe except in arctic regions, consisting of annual or perennial, small, often tufted herbs with opposite, usually stipulate leaves, allied on the one side to Caryophyllaceae into which Engler & Prantl have merged them, and on the other side to Amarantaceae. Perianth single, inferior; flowers 2-sexual; calyx herbaceous or coriaceous, persistent round fruit; corolla absent; stamens perigynous, opposite sepals; ovary 1-locular; styles 2-3; ovules 1-2. The name is said to be derived from *illecebra*, an enticement.

501 (2) PARONYCHIA [Tourn.] Mill. Gard. Diet. Abr. 1754.

A genus of about 40 species, natives of S. and E. Europe, Central Asia, N. and tropical W. Africa, Canaries, North and South America, especially well represented in Chile and Argentina. They consist of prostrate herbs, often woody at base, with silvery, scarious bracts; opposite leaves; small, clustered, scarious-bracted, apetalous flowers. The name comes from *para*, and *onuckion*, a cure for whitlows.

2102 *P. brasiliana* DC. in Poir. Enc. v. 23, 1804.

P. bonariensis DC. Prod. iii. 370.

Brazil, Paraguay, Uruguay, Chile, Peru. Adventive in France, 1893, Belgium, Germany.

Poiret (*op. cit.*) describes it as "caulibus diffusis, foliis pubescentibus, aristatis." A prostrate caespitose plant, perennial, with acute oval-oblong leaves, which are usually covered on both surfaces with adpressed pubescence; flowers in compact clusters; sepals terminated by a long, straight, sub-spinescent point.

First record: As *P. bonariensis* DC. from the Tweed, J. Fraser. See *Rep. B.E.C.* 350, 1908 and *Ann. Scot. Nat. Hist.* 43, 1909. This is also the *P. chilensis* DC. of *Rep. B.E.C.* 29, (1911) 1912. Found rarely by the banks of the Gala below Galashiels, Selk., I. M. H., September 1911. Det. A. Thellung.

2102 (II) *P. polygonifolia* Lam. & DC. Fl. Fr. iii. 403.

South Europe—Spain, France, Corsica, Piedmont, Greece.

A small, glabrous perennial growing in circular tufts with the branches appressed to the soil; leaves oval-lanceolate, smaller and closer than those of its ally, *argentea*; bracts broad, silvery, channelled, with scarious margins, longer than the flower; capsule dehiscing at the base.

First record for Britain: By the Gala, Selk., A. Brotherston in *Proc. Berw.* 136, 1873. He queries whether this is not the *Herniaria* mentioned by Stuart in *Proc. Berw.* 15, 1869. He also mentions there an "Illecebrum" from Tweedside, the identity of which is quite uncertain.

502 HERNIARIA (Tourn.) L.

A genus of about 20 species represented in Europe, Asia, Africa and South America, natives of sandy places. Plants of low growth and unattractive appearance, being tufted, greyish or green herbs with stipules very minute; flowers small, green, angular, crowded in little axillary cymes; stamens 5, alternating with the 5 filaments; stigmas two. The name is derived from *hernia*, a rupture—for which affliction the plants, on slender evidence, were said to have been useful.

2105 *H. hirsuta* L.

Europe — Belgium, Portugal, Spain, France, Italy, Switzerland, Germany, Austria, Hungary, Crete, Dalmatia, Turkey; Beluchistan, Kashmir to Kumanwar, Punjab, Canaries. Adventive in Britain and New Zealand.

A small, prostrate annual or biennial species, densely hairy; leaves long, ciliated, mostly opposite, each division of the perigone terminated by a bristly hair; stigmas sub-sessile.

First found in Selk., I. M. H., September 1911. On shingle, but infrequent, near the mouth of the Gala. Only observed flowering in September. Named at Kew.

2106 *H. cinerea* Lam. & DC. Fl. Fr. vi. 375, 1815.

Spain, S. France, Italy, Dalmatia, Croatia, Greece, Egypt.

Annual or biennial, 15 cm.; stem and branches ash-coloured, hirsute, not quite so appressed to the soil as *hirsuta*, which it closely resembles; parts of the perigone in fives, clothed with long and nearly equal ashy hairs; flowers sessile, 7-10, in crowded clusters, nearly as long as the sepals are broad; styles 2, distinct, short; leaves oblong-linear, mostly alternate.

First record: As *H. hirsuta*, I. M. H., October 1907. See *Tr. Bot. Soc. Edin.* 43, 1909. Found plentifully on a woollen mill wall, also by the banks of the Gala near its junction with the Tweed, Selk. Flowering September to October. Named at Kew.

G. C. A. Stuart (*Proc. Berw.* 75, 1896) records a species of *Herniaria* from Tweedside between Galashiels and Melrose, which is probably one of the foregoing.

71 AMARANTACEAE Jussieu.

A family of about 500 species divided into 54 genera which are most plentifully represented in the hot countries of the world, where

they often form pestilent weeds. They have little economic value, and with the exception of *Celosia*, *Gomphrena* and a few *Amaranth*s have little beauty to attract the horticulturist, notwithstanding their poetic name, which is derived from *a*, not, and *maraino*, to wither, in reference to the length of time some species retain their colour. They are herbs or rarely shrubs, with exstipulate, usually entire leaves, and inconspicuous, apetalous flowers; the fruit generally a membranous utricle, rarely capsular or baccate, enclosed by or resting upon the persistent perigone.

505 AMARANTHUS [Tourn.] L.

The genus consists of about 45 species, many of them common weeds in all parts of the world. In some instances it is difficult to state with certainty their native home. They have small, red or green, glabrous flowers which are arranged in a dense, spicate or capitate inflorescence, never spinescent, 1-bracteate, with 2 bracteoles, which in some species are longer than the flower; fruit mostly membranous, dehiscent by a lid or indehiscent; leaves alternate—in the troublesome tropical weeds, *Achyranthes* and *Alternanthera*, opposite. Love-lies-bleeding and Prince's Feather are cultivated forms of *A. caudatus* and *A. hypochondriacus*.

2110 *A. retroflexus* L.

Pigweed (U.S.A.).

Weed Flora of Iowa 114, t. 64. Thell. *Amaranth*. 254.

Geographical distribution: Nyman gives Spain, France, Germany, Switzerland, Italy, Austria, Hungary, Transylvania, Dalmatia, Herzegovina, Bosnia, Serbia, Roumania, Turkey, Greece. It also occurs in the Caucasus, Syria, China, N. Africa, Canaries, New Zealand. Thellung (*Fl. Adv. Montp.* 200) thinks it is a native of tropical America, and it is naturalised in North America, Europe, Central and W. Asia.

Plant annual, 2-7 dm., simple or branched; leaves narrowed gradually into the stalk, oval or oblong, mucronate, entire or undulate-sinuous, pale green, strongly punctate on the under surface; flowers green; perigone 5-partite; stamens 5; style short, equalling the perigonal divisions; fruit dehiscent by a lid; bracts twice as long as perigone, lanceolate, spinulose, with the spines 5 mm. long.

First found on mill refuse at Galashiels, Selk., and by Tweedside, Roxb., I. M. H., 1908. See *Tr. Bot. Soc. Edin.* 43, 1919.

Var. *DELILEI* Thellung in Viertelj. Jahr. Naturf. Ges. Zürich lii. 442, 1907. *A. Delilei* Richter & Loret in Bull. Soc. Bot. France xiii. 316, 1866. *Fl. Adv. Montp.* 201.

France, Italy, Greece, Switzerland, Germany, Sweden, Algeria.

This differs from the type in the leaves being more abruptly contracted into the stalk and in being less punctate on the under

surface ; in the terminal spike being scarcely longer than the lateral and in the bracts being shorter (3-4 mm.).

First discovered in Britain at Galashiels, Selk., I. M. H., 1911. See *Rep. B.E.C.* 19, (1914) 1915. Det. A. Thellung.

2110 (2) *A. angustifolius* Lam. Enc. i. 115, 1783.

A. graecizans L., p.p. *A. Blitum* Moquin. Fig. 54.
Thell. *Amaranth.* 298.

Mediterranean coasts, N. Italy, Switzerland, Germany—Baden ; Holland, Belgium, Austria, Hungary, Dalmatia, Herzegovina, Transylvania.

Main stem usually erect with erect or spreading branches, glabrous or (especially in extra-European forms) somewhat pubescent above, often tinged with red, up to 70 cm. high ; foliage leaves variable in form (compare the races and varieties), ovate-rhomboid or elliptic-rhomboid or obovate to linear-lanceolate, generally attenuated at both ends (but usually bluntish at the outer end), rarely obtuse (but not conspicuously bordered), with short awn-like points, breadth in the middle about $2\frac{1}{2}$ cm., dirty-green or reddish, usually thin and finely undulate at the margin ; flower-heads collectively axillary ; bracteoles ovate-lanceolate or lanceolate, acuminate, membranous with a green, upwardly broadened middle nerve, about $\frac{2}{5}$ - $\frac{3}{4}$ as long as the perianth, with shorter or longer prickly point ; male flowers 3-partite : perianth leaves ovate-lanceolate, acute or acuminate, about 1-1 $\frac{1}{2}$ mm. long, membranous with a green nerve ; female flowers broadly or narrowly elliptic-lanceolate or lanceolate or elongate, acute or acuminate, membranous with a green upwardly widening nerve, about 1.3-1.9 mm. long with a shorter or longer prickly point, about $\frac{2}{3}$ - $\frac{3}{4}$ as long as the fruit, the latter in the typical species roundish-ellipsoid, compressed, acute or shortly prickly pointed, about 1 $\frac{1}{2}$ -2 mm. long, more or less wrinkled, with a sharply defined lid developing early transversely ; seed about 1-1 $\frac{1}{2}$ mm. diameter.

First found in Britain near Galashiels, Selk., I. M. H., October 1913. See *Rep. B.E.C.* 207, (1915) 1916. Near the junction of the Gala and Tweed but less plentifully than others of this genus. Flowering September to October. Det. A. Thellung.

2111 *A. lividus* L., var. *ascendens* Thell. *Amaranth.* 322, 1914.

A. Blitum Sm. Eng. Bot. t. 2212, 1810. *A. minor* S. F. Gray.

A weed of cultivated ground, found in warm countries. Europe—Macedonia ; Transcaucasus, Syria ; Beluchistan, where it is used as a vegetable ; China, N. Africa—very common in Egypt ; Canaries, America, Pacific Isles. Adventive in New Zealand.

A glabrous, branching, decumbent annual about 3-4 dm. ; leaves narrow-oblong to obovate, 1-1 $\frac{1}{2}$ -4 cm. long ; inflorescence axillary,
N



Fig. 54.

AMARANTHUS ANGUSTIFOLIUS Lam.

in dense clusters ; perigone small, about $1\frac{1}{2}$ mm., shorter than the indehiscent fruit.

First record : *A. Blitum*, banks of the Gala, Selk., Stuart in *Proc. Berw.* 79, 1869-72. Its correct identity is doubtful.

This species, as treated by different authorities, is much confused.

2111 (2) *A. albus* L. Syst. ed. x. ii. 1268, 1759. *Tumble Weed*.

Blitum graecizans Moench. *Atriplex* L., p.p.

Tropical America, in sandy ravines in the Southern States, Mexico. Adventive in North America, Argentina, Britain, S. France, Switzerland, Germany, Austria, Hungary, Portugal, Spain, Italy, Greece, S. Russia, Syria, N. Africa, Egypt. See Thell. *Mon. Amaranth.* 283.

Stem usually erect, copiously branched, the spreading branches furnished with many whitish (seldom reddish), generally entirely glabrous (rarely downy) leaves ; foliage leaves thin, waved at the margin, glabrous, obovate-lanceolate or spatulate, usually narrowed into the stalk, obtusely rounded at the apex or slightly emarginate, with a projecting awn-like point about $\frac{1}{2}$ -1 mm. long, size about 2 by 1 cm. ; flower-heads collectively axillary, dichasial, those of the smaller side branches often scantily flowered, collected into loose clusters interrupted by small spatulate long-awned bracts ; bracteoles subulate, membranous-edged below, above running out into a stout thorny point twice as long as the flowers ; flowers of both sexes normally tripartite : male perianth leaves lanceolate, long, tapering, aristate, about 1 mm. long, white ; female ones about the same length, linear-elliptic, bluntish or more or less sharply pointed, generally whitish also ; fruit about $1\frac{1}{2}$ mm. long, roundish-ellipsoid, compressed, somewhat wrinkled-tuberculose above, shortly sharp-pointed, with a deep transverse notch ; seed about 0.8 mm. in diameter, sharp-edged.

First found along the banks of the Gala, Selk., and Tweed from Gala-shiels to Dryburgh, 9 miles, Roxb., I. M. H., 1913. Still very plentiful. Flowering August to September. Det. A. Thellung.

2114 *A. chlorostachys* Willd. Hist. Amaranth. 34, t. 10, f. 19, 1790. *A. hybridus chlorostachys* Thell. Mon. Amaranth. 237, 1914. Fig. 55.

Tropical America. Adventive in Europe, Syria, Cyprus, N. & S. Africa, Egypt.

Stems erect, striate-sulcate, pubescent or scabrous, greenish ; leaves long petioled, deltoid-ovate or ovate, obtuse or sometimes sub-acute, scabrous, greenish coloured ; panicles branched ; spikes ascendent, cylindrical, acute, the terminal long, subflexuous, the lateral shorter, narrowed ; flowers greenish coloured ; sepals as long as the bract or shorter ; utricle longer than calyx, 2-3-dentate at tip, rugose. See Muschler *Fl. Egypt* i. 308.



Fig. 55.

AMARANTHUS CHLOROSTACHYS Willd.

Var. **PSEUDO-RETROFLEXUS** Thellung in Viertelj. Nat. Ges. Zürich lii. 443, 1907.

Bracteoles very stout, mostly not less than 5 mm. long, often still longer; female perianth leaves often as long or longer than the fruit; hairs mostly stout and dense, often short. The plants therefore have the aspect of the type, but are easily to be distinguished by the feebly-haired or almost glabrous stem and the very pointed female perianth leaves, the late flowers of both sexes often only 4-3 partite.

First found in Britain at Galashiels, Selk., I. M. H. See *Rep. B.E.C.* 208, (1915) 1916. In the vicinity of Galashiels Skin-works, and thence along the banks of the Gala to its junction with the Tweed, from 1908. Flowering August to September.

Var. **ARISTULATUS** Thellung in Aschers. & Graeb. Syn. Mitt.-Eur. v. 240, 1914. Argentina.

Female perianth leaves for the greater part (3 or 4) running out into a distinct awn-like point about $\frac{1}{2}$ mm. long.

With above.

These two varieties, new to Britain, were determined by A. Thellung.

2116 (5) A. Thunbergii Moquin in DC. Prod. xiii. 2, 262, 1849.

A. albus Thunb. Prod. Fl. Cap. 45, 1794, not of L. *A. graecizans* Baker and C. B. Clarke in Dyer Fl. Trop. Afr. vi. 1. 34, 1909, not of L. Thell. Mon. Amaranth. 280. *Rep. B.E.C.* t. ad 332, 1913.

Africa: Eritrea, Lower Guinea, Angola, Abyssinia, Mozambique, Portuguese East Africa, Lower Gambia, British Central Africa, Nyasaland—Fort Hill, Shire Valley; Cape—Grootschuur (!) etc.; Basutoland, Bechuanaland, Transvaal, Natal—Isanda, etc.

Stem 3-5 dm., ascending, striate, glabrous, often tinged with purple, branched; leaves 12-25 mm. long, 4-12 mm. broad, ovate, obovate or spatulate, obtuse, apiculate, cuneate at base, margins more or less undulate and convex, strongly nerved underneath, broadest at or above the middle, always obtusely tapering; flowers in small axillary heads; bracts $2\frac{1}{2}$ mm. long, lanceolate, the strong midrib produced into a sharp point; perigone 3 mm. long; fruit dehiscing by a lid, $2\frac{1}{2}$ mm. long, membranous; sepals produced in a long, slender, aristiform point; stigmas 3. See Dyer *Fl. Trop. Afr.* vi. 410, 1910.

First found in Britain at Galashiels, I. M. H., October 1909. See *Rep. B.E.C.* 332, (1912) 1913, and Thell. *Mon. Amaranth.* 281, 1914. Plentifully in the vicinity of Galashiels Skin-works and along the banks of the Gala and Tweed from Galashiels, Selk., to Dryburgh, Roxb. Flowering September to October. Det. A. Thellung.

2116 (6) A. Dinteri Schinz in Mem. Herb. Boiss. No. 20, 15, 1900, var. **uncinatus** Thell. in Fedde *Rep.* xiii., n. 351, 79, 1913.

S. Africa. As a wool alien in Germany and Switzerland. Fig. 56.



Fig. 56.

AMARANTHUS DINTERI Schinz, var. UNCINATUS Thell.

The type has stems generally numerous, prostrate, up to 30 cm. long and over, much branched, copiously leaved, above downy with short straight hairs; foliage leaves obovate-spathulate to almost roundish, obtuse, with very short prickly points about 7-12 by 5-9 mm., usually finely waved at the margin; bracteoles lanceolate-subulate, about $1\frac{1}{2}$ -2 mm. long (without the prickly point), the lower ones broadly membranous, the upper similar in texture to the female perianth leaves; male flowers tripartite; perianth leaves ovate-lanceolate to elliptical, pointed or bluntish or shortly acuminate, with shorter or longer prickly points, excluding these about 2-3 mm. long, mostly all of them thin (with only a narrow green nerve), rarely single ones of stouter consistence; female perianth leaves three, in the upper part at least of the separate flower clusters stout, for the most part green (except the middle nerve, which is provided with branched and anastomosing side nerves), ovate-lanceolate, sharply acuminate, with a distinct, stout (about $\frac{1}{3}$ - $\frac{3}{4}$ mm.) prickly point, rarely some are bluntish under the point, in that case broadly membranous as far as the point, about 2-3 mm. long without the point; fruit about $2\frac{1}{2}$ mm. long, somewhat wrinkled, ellipsoid, compressed, three-pointed, opening with a sharply defined lid; seed $1\frac{1}{4}$ mm. in greatest diameter, sharp edged. . . . Divided into two races (varieties?), of which only the second has been identified in Central Europe:—(a) *Typicus*—Awn-like points of bracteoles and perianth leaves moderately straight, erect or more or less spreading; perianth leaves (excluding awn-like point) mostly only 2 mm. long, the one or two larger of the female flowers strongly thickened and hardened at the base at the time of ripening fruit, often becoming somewhat sac-like, hence the perianth becomes stumpy at the base and distinctly deformed. Hitherto only found in South Africa. (b) *Uncinatus*—Awn-like points of bracteoles and perianth leaves bent outwards like a hook; flowers rather larger; perianth leaves (without the awns) mostly $2\frac{1}{2}$ -3 mm. long, not conspicuously thickened at the base, the perianth therefore more narrowed at the base and less distinctly deformed. Only this form has spread to Germany.

First found in Britain, I. M. H., September 1908. See *Rep. B.E.C.* 208, (1915) 1916. Found plentifully at the junction of the Gala and Tweed, Selk., extending along the Tweed as far as Dryburgh, Roxb. Flowering August to October. Det. A. Thellung.

72 CHENOPODIACEAE Dumortier.

A large cosmopolitan family of 83 genera [Dur.] and 600 species, best represented on the coasts and on alkaline and saline desert tracts, consisting of herbaceous and shrubby, often succulent species, in the main greyish or hoary, but sometimes green, with unicoloured inflorescence and singularly unprepossessing appearance. Excepting in a few instances they are of little economic value. A few species when

burnt yield alkali. The tuberous root-stock of the Beet is largely used for the sugar which it yields, the Mangold is a good food for cattle, and Spinach is to some an attractive vegetable. Stems sometimes leafless and articulate; leaves exstipulate; flowers 1-2 sexual, greenish; calyx 3-5 lobed, herbaceous, persistent round the fruit; stamens 1-5, opposite the sepals; ovary 1-locular; fruit consisting of a very small seed in a thin or sometimes succulent pericarp.

506 CHENOPODIUM (Tourn.) L.

A widely distributed, weedy genus of about 60 species, world-spread, following mankind wherever he settles. A few are natives of tropical regions, but the genus is most common in the temperate regions of the world. *Chenopodium* (*chen*, a goose, and *pous*, a foot, hence its vernacular name, Goosefoot) is characterised by its annular embryo, leafy stem, bisexual flower and membranous utricle, a genus of which only one, Good-King-Henry, is useful to mankind. This species, is only occasionally planted over small areas to be used as a potherb. No genus is more variable or more critical. None is more lavishly represented either in the number of species or of individuals on the banks of the Gala and Tweed as the result of wool-cleansing. The severe treatment the seeds undergo may account for the absence of many Lamiaceae, or possibly these may be less able to bear the colder climate of the north. But be the reason what it may, there can be no doubt that the washing in boiling water and the carbonisation by means of strong acid have no effect in arresting the germination of the Goosefoots, if indeed these processes do not really afford the necessary stimulant. Even in the less disturbed areas of Britain where *C. album* has existed for long periods the species is a polymorphic one. This may be owing to its being an aggregate of two or three micro-species which freely hybridise and give rise to many plants which only the critical acumen of special students like Dr Murr can differentiate. It may be that when such a plastic species is put under new conditions its tendency to vary increases, and specific limitation to some extent breaks up; or more probably the correct explanation is that under new conditions that mutual sterility of allied forms which long contiguity has established disappears when there is greater necessity to increase its progeny. This appears to be the explanation of the almost unending variation of the Chenopods of Tweedside, because there is represented not only our own forms of *album* and its allies but from the four quarters of the world is brought the same species with its range of variations, and the resulting crosses are as the sands of the sea in multitude. Not only so, but species which appear mutually infertile in their own country under new conditions put aside any sense of morality and form combinations of a most perplexing and unlooked for nature. Such a one, previously undescribed, the offspring of the Argentine *hircinum* and the Indian *striatum*, was discovered at Galashiels and was named by Dr Murr, *Chenopodium Haywardiae*. Respecting the so-called hybrids of *Chenopodium* M. Rouy (*Fl. de Fr.* xii. 46) quotes M. Issler of Colmar, the well known authority on the genus, who discovered *C.*

striatum in Alsace and also found plants which Dr Murr has named *album* × *opulifolium*, *album* × *ficifolium*, *album* × *striatum*, and *viride* × *striatum*, “M. Issler est revenu, et nous croyons qu’il a absolument raison, à une juste appréciation des faits, ne voyant plus dans ces prétendus hybrides ou métiés que des variations des diverses variétés du type *C. album* auxquelles elles se rattachent naturellement.” Dr J. Murr, to whom many of the British Chenopods have been sent, writes:—“Mr George Claridge Druce, Hon. M.A., past Sheriff and Mayor of the City of Oxford, sent me lately, at the request of my esteemed friend, Dr Arpad von Degen, for revision and classification two parcels of critical Chenopodiums collected by him and his botanical friend. They consisted, among others, of a series of new finds for Great Britain, all the more important since they chiefly exhibit the appearance of plants which could only be adventive in that island because of its oceanic climate. The most numerous finds belong to the county of Selkirk in South Scotland, and were made by Miss Ida M. Hayward. They are *C. glaucum* L., sub-sp. *ambiguum* (R. Br.) Murr and Thell. in *La Flore Adventice de Montpellier* by A. Thellung (p. 196), from Australia; *C. carinatum* R. Br., also from Australia; *C. hircinum* Schrad., from S. America; *C. leptophyllum* Nutt., from North and South America; *C. Berlandierii* Moq., from the warmer regions of N. America, besides several beautiful specimens very near *C. Borbasii* mihi (*C. opulifolium* Schrad. × *album* L., forma) exhibiting the unique nervature appearing from the almost Spanish green ground on the under side of the sharp dark leaves, and the similar leaves of the combination *C. Berlandierii* Moq. × *album* L. In the second parcel from Druce was *C. opulifolium* (named *C. hircinum*) from Exeter, South Devon, August 1908; and it was also sent from Milverton, near Warwick, H. Bromwich, 1898 (named *C. ficifolium* by E. G. Baker). Druce’s first packet contained a typical example of the *C. striatum* (Kras.) mihi from Bristol, 1897, collected by James White, and as far as the then existing knowledge went, classified by him as *C. glomerulosum* Reichb. This is, as I have said, the most northerly appearance hitherto known of this south-east Asiatic sub-species.” The following note by Dr Murr on the “Weiteres zur Adventivflora von Grossbritannien” appeared in *Allgemeine Botanische Zeitschrift* Feb. 1914:—“A short time ago Herr Altburgermeister G. Cl. Druce von Oxford gave me some rich Chenopodium material to classify which had been sent by Miss Ida M. Hayward, Galashiels, Selkirk, Scotland. In addition to the species and forms notified by me in the *Allgem. Bot. Zeitschrift*, 13, 1913 (cf. p. 73), I had before me this time a varied and beautiful *C. striatum* (Kras.) mihi, recorded by me as existing in other places, but for the first time found growing in Great Britain near Bristol. There were also all the intermediate forms between *C. striatum* and *C. album*, especially a great deal of *C. pseudostriatum* Zschacke, some *C. interjectum* mihi, etc., and numerous specimens of *C. praeacutum* mihi with the var. *laciniatum* mihi, and (from the Woollen Mill at Galashiels) a nov. var. *muraliforme* (foliis sat parvis, ovato-lanceolatis acutis, acute dentatis, supra perobscure viridibus subtus cano-farinosis nervis

tenuibus nigris). Further, along with *C. hircinum* Schrad. and var. *subtrilobum* Issler and *C. hircinum* × *album* there were four or five specimens of the fine new hybrid of *striatum*, which I have named *C. Haywardiae*. In addition to a specimen of *C. anthelminticum*, the packet contains a small but faultless example of the Indian *C. graveolens* Willd., which has been observed in Galashiels—the first time in Europe so far as I am aware.”

2117 *C. rubrum* L.

Blitum rubrum Reichb. Syme E. B. viii. t. 1196.

Throughout Europe except the extreme north, Asia except the south, Caucasus, Turkestan, Siberia, Azores.

Herbaceous, stem 1-8 dm., glabrous, often tinged with red; leaves long-stalked, thick, shining, paler on the under surface, variable in outline, hastate-lanceolate or triangular-rhomboid; glomerules often very numerous and aggregated, all axillary or the upper forming a dense, terminal, leafy panicle; seeds brown, smooth, shining, very small, $\frac{3}{4}$ mm., vertical except in those of the terminal flower which are horizontal. A polymorphic species, prostrate or erect, varying in height from 2 cm. to 20 dm.

First record: I. M. H., August 1908. See *Tr. Bot. Soc. Edin.* 43, 1909. In the vicinity of Galashiels Skin-works, and along a stretch of the Gala half a mile further on, Selk. Flowering August to September. Det. G. C. Druce.

2122 *C. murale* L.

Syme E. B. t. 1192.

Throughout Europe except Norway, N. Russia and Turkey, but often adventive. Caucasus, Persia, Beluchistan, India, Arabia; Egypt, everywhere as a weed; Afghanistan, Canaries, Cape (!), Natal, Queensland, Victoria, Tasmania, New Zealand, America.

Plant without foetid odour, about 2-7 dm.; leaves somewhat fleshy, shining, green, the young ones sometimes slightly farinose, stalked, oval-rhomboid, rather rounded, wedge-shaped at base, pointed, with many conspicuous, ascending and unequal teeth; perianth divisions completely enclosing the fruit; seeds blackish-green, opaque, finely rugose, with a sharp, horizontal keel, 1-1.2 mm., about the size of that of *C. album*.

First record: Quite common about the river side, Melrose, Roxb., Stuart, 1868, in *Proc. Berw.* 79, 1869-72. Selkirk, I. M. H., 1910. Found plentifully near Melrose, Roxb., and the mouth of the Gala, and also near Selkirk, Selk., I. M. H. Flowering August to September. Thomson found it at Holy Island in 1807.

Several modifications exist at Galashiels to which no special names have been assigned by Dr Murr.

Var. *MICROPHYLLUM* (Cosson) Boiss. *Fl. Orient.* iv. 902, 1879.

Differs from the type in the smaller, less deeply cut leaves.

2123 C. opulifolium Schrad. ap Koch & Ziz. Cat. Pl. Palat. 6, 1814.

Nomen. Lam. & DC. Fl. Fr. v. 372, 1815. Ic. Vaill. Bot. t. 7, f. 1.

Portugal, Spain, France, Belgium, Germany, Switzerland, Italy, Austria, Hungary, Transylvania, Adriatic coast, Greece, Serbia, Transcaucasus, Arabia, Syria, Persia, Egypt, Abyssinia, Algeria, Madeira, N. America. Adventive and common in Britain.

Plant inodorous, mealy-white, 3-8 dm., erect, branched; stem angular; leaves stalked, rhomboidal, narrowed at base, sub-trilobed, the lobes not very pronounced, sinuate-dentate, the middle one rounded, very obtuse or truncate, only a little longer than the lateral, the upper leaves of the same form but narrower and more acute; perianth divisions hiding the fruit; seeds rather rugose, shining, with a thick border.

First record: Kelso, Roxb., a wool introduction, A. Brotherston in *Rep. Bot. Rec. Club* 1878. Galashiels, Selk., G. C. Druce in *Ann. Scot. Nat. Hist.* 100, 1910.

2124 C. album L.

Goosefoot.

Syme E. B. viii. tt. 1188, 1189, 1190.

Throughout Europe as a weed and throughout the temperate regions of the world. Adventive also in the north, and in many of the tropical countries of both hemispheres. It is used as a vegetable in Beluchistan.

A very polymorphic species without disagreeable odour, usually covered more or less completely with a mealy powder, the plants varying from 1 to 15 or more dm., usually much branched; leaves stalked, very variable in outline and tothing; flowers in moderately large glomerules, arranged in short, dense, simple or slightly compound, leafless spikes, arranged in slender, leafy, terminal panicles, or sometimes the glomerules are in lax, compound, spreading, lateral and terminal spikes, leafy towards the base, or in small cymes, sparingly leafy at base, the spikes or cymes combined into a lax, leafy panicle, or the inflorescence may be modifications of the foregoing; perigone segments hiding the fruit, keeled on the back, with scarious edges; seeds all horizontal, smooth, shining, blackish, keeled all round.

Found in the vicinity of Galashiels Skin-works, along the banks of the Gala, Selk., and by the side of the Tweed at various places south to Dryburgh, Roxb. Also on wool-waste heaps at Galashiels and Selkirk, where plants were exceptionally large and strong. Although *C. album* is a common British native the quantities seen, and notably the localities, seem to make it clear that the Tweedside specimens are derived from imported wool. This is supported by the fact that *C. album* is reported by Cheeseman (*Manual of New Zealand Flora*) as a common New Zealand weed, wool from that colony being imported into the district in large quantities.

Dr Murr has named the following forms which have been found at Galashiels by I. M. H.

Var. *OBTUSATUM* Gaudin Fl. Helv. ii. 252, 1828.

Leaves long-stalked, broadly oval, sinuate-dentate, glaucescent below, for the most part very obtuse, the upper pointed. This is probably a variation of the British form.

Galafoot, Selk., September 1913. See *Rep. B.E.C.* 332, (1913) 1914.

Var. *ALBO-FARINACEUM* Sonder Fl. Hamb. 143, 1851.

A very white, mealy plant found on a waste heap at a woollen mill, Galashiels, also on the banks of the Gala, Selk., September 1913. It is closely allied to *candicans*. See *Rep. B.E.C.* 333, (1913) 1914.

Var. *PEDUNCULARE* (Bert.) Moquin in DC. Prod. xiii. 2, 71, 1849. *C. album* × *viride* Murr. Put under *C. album*, var. *viride* by A. & G.

Leaves oblong-lanceolate, entire or nearly so, under surface very pale, suffarinateous, glomerules in few-flowered, naked, cymiform, long-stalked spikes, with sometimes solitary flowers.

Galashiels, Selk., September 1913. See *Rep. B.E.C.* 333, (1913) 1914. By the Tweed between Galashiels and Melrose, Roxb.

Var. *BORBASIFORME* Murr, *in litt.* Sub-sp. *borbasiforme* Murr, *in litt.* See *Rep. B.E.C.* 174, (1912) 1913.

Galashiels, Selk., I. M. H., 1913. See *Rep. B.E.C.* 333, (1913) 1914. Found by G. C. Druce at Lerée, Guernsey, in 1907.

Var. *CANDICANS* (Lam.) Moquin, *l.c.* Syme E. B. viii. 13, t. 1188. *C. candicans* Lam. Fl. Fr. iii. 248, 1778. ? *C. album*, var. *spicatum* Koch Syn. 606, 1837, with the inadequate description "floribus spicatis."

Abundantly covered with white mealy matter; plant usually erect, not much branched or with sub-erect branches; leaves rhombic-triangular-ovate, dentate, serrate; glomerules collected into short, axillary and terminal, erect, simple or nearly simple, dense spikes, the axillary ones shorter than the leaves from which they spring; spikes combined into a very slender, acute panicle. Syme E. B. viii. 13.

Galashiels, Selk., I. M. H., September 1912, but less frequent than *viridescens* and *viride*.

Var. *LANCEOLATUM* (Muehl.). *C. lanceolatum* Muehl. in Willd. Enum. Hort. Berol. 291, 1809.

Galashiels, Selk., I. M. H., 1913. Found by G. C. Druce at Taplow, Bucks., in 1904.

Var. *VIRIDESCENS* St Amans Fl. Agenaise 105, 1821. *C. paganum* Reichb., p.p.

This is normally a much larger, more branching, greener and less mealy plant than *candicans*, resembling *viride* in its habit and greenness, but the glomerules, instead of being cymose, are arranged in "elongated, lax, axillary and terminal, erect, usually compound, lax and interrupted spikes, the axillary ones longer than the leaves from

which they spring, and the spikes combined into a lax, pyramidal panicle." Syme *E. B.* viii. 14.

A very common and variable form in the British Isles on rubbish, waste ground and manure heaps.

Found commonly by the Gala and Tweed, Selk. and Roxb., I. M. H., since 1911.

Var. *VIRIDE* (L.) Wahl. *Fl. Suec.* 158, 1826.

This differs from *viridescens* in the narrower and less cut leaves and in the cymose inflorescence; from *candicans* in its being normally a greener plant with narrower leaves and cymose inflorescence. It is probably a good sub-species.

Found at the junction of the Gala and Tweed, Selk., I. M. H., September 1913.

Under *C. viride* as a sub-species Dr Murr places one of Miss Hayward's Galashiels specimens as var. *pseudopolyspermum* Murr in Aschers. & Graebn. *Syn. Fl. Mitt.-Eur.* v. 52. and G. C. Druce has gathered the same plant at Linslade, Bucks.

Var. *PAUCIDENS* (Murr in Aschers. *Festschr.* 70 Geb. 220, 1904) as a sub-species.

With the aspect of var. *viride*, this plant has more entire leaves. It is not uncommon, and is widely spread in Britain, being first gathered at Northampton by G. C. Druce in 1877.

Found at Galashiels, Selk., I. M. H., 1913.

Var. *PRAEACUTUM* (Murr as a sub-species in *Deuts. Bot. Mon.* xix. 72, 1901). Beck in *Reichb. Ic.* xxiv. 104, 1907. *Mag. Bot. Lap.* 304, 1907.

Found rather frequently by I. M. H. near the Skin-works, Galashiels, Selk., September 1912, and in other places about and by the Tweed, Roxb., and as the forma *farinosa*, with the dense mealy foliage of *candicans*, also as forma *laciniatum* (Murr as a variety of the sub-species *praeacutum* Asch. & Graeb. *Syn. Fl. Mitt.-Eur.* v. 45), a form with more deeply cut teeth, Galafoot, Selk., September 1911, and also as forma *microphylla*, which is a very small-leaved plant akin to f. *farinosa* in its mealiness. Also a plant described as sub-species *praeacutum*, var. *muraliforme* by Dr Murr in *Allgem. Bot. Zeit.* 25, 1914, discovered by I. M. H. at a woollen mill, Galashiels, Selk., on mill-refuse.

Leaves rather small, ovate-lanceolate, acutely dentate, obscure greenish above, mealy white below, with thin black nerves. See *Rep. B.E.C.* 19, (1914) 1915.

Var. *PSEUDO-BORBASIFORME* (Murr in *Deuts. Bot. Mon.* xix. 51, 1911, as a species). *C. striatum* × *album* Murr in *Deuts. Bot. Mon.* xix. 51, 1901.

This was found by G. C. Druce near Oxford, and by D. Lumb at Dalton-in-Furness, as the type with leaves purple-margined, and irregularly, obtusely dentate leaves, approaching var. *borbasiforme* on one side and var. *praeacutum* on the other, whereas the plants gathered

by I. M. H. at Galashiels, Selk., 1913, approach *C. album*, var. *trigonophyllum* Murr, 55 Jahr. Staats-Gymn. Feldk. 1900 = *C. striatum*, var. A. & G., l.c. 65, 1914, in their broader and less acute leaves with more angled teeth. Another specimen from Galashiels was more typical *pseudo-Borbasii*. I. M. H. also gathered it on an embankment of the Tweed a mile below Galafoot, Roxb.

Var. *PSEUDOSTRIATUM* Zschacke in Deuts. Bot. Mon. xix. 25, 1901 = *C. album* × *striatum* Murr in Aschers. Festschr. 70.

A very variable plant. Some specimens gathered by I. M. H. at Galashiels, Selk., in 1913 had sub-entire leaves, others long narrow leaves approaching var. *lanceolatum*, ? *C. striatum* × *album-lanceolatiforme* and *C. striatum* × *album-praeacutum*. These forms were mainly found at Galafoot, Selk., near the junction with the Tweed, in September 1913, and also further down in Roxb. Dr Murr characterised one of these plants as follows:—*C. striatum* mihi—*lanceolatiforme* mihi—foliis angustis subtrilobis, superioribus integris mucronatis saturate viridibus, caule purpureo-striato. *Allgem. Bot. Zeit.* Jan.-Feb. 25, 1914.

Var. *SUBFICIFOLIUM* (Murr as a sub-species in Aschers. Festschr. 70 Geb. 218, 1904) = *C. pseudoficifolium* Murr in Deuts. Bot. Mon. xix. 51, 1901, not of Turczanninow.

A plant with much of the appearance of *ficifolium*, but the seeds are as in type *album*.

I. M. H. found a small specimen at Galashiels, Selk., September 1912. See *Rep. B.E.C.* 174, (1912) 1913. Also found on the banks of the Tweed near the mouth of the Gala, Selk., and at various places between, south to Melrose, Roxb. Flowering September to October. G. C. Druce found this plant in Oxford in 1890. In August 1911 I. M. H. found a form of *C. album* on the Gala banks near Galafoot, Selk., which Dr Murr said had the inflorescence approaching that of var. *glomerulosum* Reichb.

Var. *BERNBURGENSE* (Murr) = *Chenopodium bernburgense* Murr in Deuts. Bot. Mon. xix. 50, 1901, et in Ar. Fedde 218, 1904. *C. striatum*, var. *bernburgense* A. & G. Syn. lxviii. 64, 1903.

First record for Scotland, I. M. H., October 1912. Near the junction of the Gala and Tweed, Selk., seldom elsewhere. Flowering August to October.

2124 (2) *C. pseudopulifolium* J. B. Scholz O. B. Z. 97, 1900, as a sub-species.

C. album, var. *pseudopulifolium* Beck in Reichb. Ic. xxiv. 107, 1907.

A good species Dr Murr says, both morphologically and geographically. G. C. Druce found it at Osney, Oxford, in 1885, and Dr Murr remarks, "haec pl. foliis crassioribus minus argute dentatis obtusioribus inflor. ut typo *pseudopulifolii* rubiginosa."

A plant I. M. H. found at Galashiels, Selk., September 1912, Dr Murr says is too young to be absolutely certain of, but he thinks it belongs to this species. See *Rep. B.E.C.* 174, (1912) 1913. Similar plants have also been found below the junction of the Gala on the Tweed side in Roxb.

2125 *C. leptophyllum* (Nutt.) Britton and Brown.

C. album L., var. *leptophyllum* Moq. in DC. Prod. xiii. 2, 72, 1849.

America, in dry soil from Manitoba and the North West Territory to Missouri, New Mexico, Arizona, Lake Erie, Connecticut—sea shore, New Jersey, Chile, Argentina. Increasingly adventive in Europe.

Herbaceous, 3-9 dm., erect or ascending; leaves linear-lanceolate or linear, nearly entire, greyish-green, mealy; racemes long. lax.

First record for Tweedside: I. M. H., 1911, in *Allgem. Bot. Zeit.* Jan.-Feb. 13, 1913. Found at the junction of the Gala and Tweed, Selk., also by the side of the Tweed between Galashiels and Melrose, Roxb. Plants abundant and robust. Flowering August to October.

2126 *C. ficifolium* Sm. Fl. Brit. i. 276, 1800.

C. serotinum auct., not strictly of L. *C. viride* Curtis, not of L. Syme E. B. viii. t. 1191.

England, Ireland, Denmark, Germany, Belgium, France (adv.), Austria, Hungary, Transylvania, Turkey, Russia, Siberia, Egypt.

Resembles *C. album* in its mealy foliage, habit and size, but differs in the leaves being narrower, with slenderer and longer stalks, the leaf-blade much more parallel-sided, more abruptly contracted and acute at the apex, and in all the leaves, except the upper ones, being sub-hastate or three-lobed, when the basal teeth are much elongated, the upper leaves linear or sub-linear; glomerules smaller; calyx-segments with very scarious borders; seeds black, distinctly roughened, and much smaller.

First record: I. M. H., September 1912. Abundant near the junction of the Gala and Tweed, Selk., also by the latter near Melrose, Roxb. Flowering August to October.

2126 (2) *C. striatum* (Kras.) Murr in Deuts. Bot. Mon. xiv. 52, 1896.

C. album, var. *striatum* Kras. Mitth. N. V. Steierm. xxx. 254, 1893.

Probably brought into Hungary by the gipsies and considered by Dr Murr to be derived from the Indian *C. rubricaula* Schrad.

Leaves oblong-lanceolate, obtuse, deep dark green, subconcolorous, strongly nerved; glomerules sessile in a dense, spicate inflorescence, forming a large, narrow panicle with erect branches. The British

specimens have stout stems with alternate, reddish and green, vertical stripes.

First record: Galashiels, Selk., I. M. H., September 1913. Found abundantly at the junction of the Gala and Tweed and at various places along the latter between Galashiels and Melrose, Roxb. Flowering September to November. Det. Dr Murr.

At the Skin-works, Galashiels, Selk., Miss Hayward also found plants which are, according to Dr Murr, apparently hybrids of *C. striatum*, var. *erosum* and *C. album* (*Rep. B.E.C.* 334, (1913) 1914) and have the aspect of *C. pseudo-borbasiforme*; others seem to be hybrids of *striatum* and *album*, var. *lanceolatum*, and others of *striatum* and *hircinum*, but not the same as *C. Haywardiae*. (See also under *C. Zschackei*.) Other specimens gathered by I. M. H. in September 1913 at Galafoot, Selk., were referred to \times *C. interjectum* (Murr in *Mag. Bot. Lap.* i. 369, 1902). See Aschers. & Graebn. *Syn.* v. 65; *Allgem. Bot. Zeit.* 25, 1914, and *Rep. B.E.C.* 333, (1913) 1914. Some plants with sub-simple leaves, found October 1913 by I. M. H., Dr Murr called forma *integrifolia*. These also occurred at Galafoot.

2128 *C. Vulvaria* L.

C. olidum Smith. Syme E. B. viii. t. 1187.

Throughout Europe except the extreme north, but often adventive; Caucasus, Persia, N. Africa, Egypt.

Plant stinking of stale fish, mealy, ash-coloured, prostrate, 1-6 dm., prostrate or ascending, the branches divaricate, spreading; leaves stalked, broadly oval-rhomboid, entire or feebly 1-2-toothed; flowers in small glomerules, arranged in short, dense, terminal and axillary, leafless spikes; perigonal divisions hiding the fruit; seeds black, shining, finely punctate, with an obtuse border.

First record for Tweedside: I. M. H., July 1909. Found on a waste heap at a woollen mill at Galashiels, also at the junction of the Gala and Tweed, Selk., also near Melrose, Roxb. Flowering July to September.

2130 *C. ambrosioides* L. *Mexican Tea, Jesuit Tea, Ambrosine.*

Ambrina ambrosioides Spach.

Britton & Brown Ill. Fl. North. U.S., etc., i. 575.

Tropical America—Monte Video, Mexico, Chile; Jamaica, Antigua, St. Vincent. Adventive in North America—Maine and Ontario to Florida, across the continent to California; France, Spain, M. & S. Russia, Asia, Syria, Afghanistan, Bengal, Silhet, Deccan, China, Egypt, Morocco, Canaries, Natal, W. Australia, Queensland, New South Wales, New Zealand.

Stem 4-7 dm., upright, branched; leaves pale green, oblong or lanceolate, narrowed into a very short stalk, glandular on the under surface, sinuate-dentate or subpinnatifid, the upper lanceolate, nearly entire; spikes axillary, usually very leafy; leaves much longer (6-10 times) than the glomerules; perigone very small,

neither mealy nor hairy; plant rather aromatic, glandular-pubescent.

First record for Tweedside: I. M. H., bed of the Gala, Selk., 1908. See *Tr. Bot. Soc. Edin.* 43, 1909, and J. Fraser in *Ann. Scot. Nat. Hist.* 43, 1909. On an embankment by the Tweed between Galashiels and Melrose, Roxb., 1914. Not often seen, but plants found of robust branching habit. Flowering August to October.

This belongs to a very polymorphic group, and has been cultivated (Thellung *Fl. Adv. Montp.* 190) since the beginning of the seventeenth century. It is now completely naturalised in France in the Midi, but it was known in Hort. D. D. Plateri in 1619.

Var. *SUFFRUTICOSUM* (Willd. Enum. Hort. Berol. 290, 1809) Thell. *Fl. Adv. Montp.* 1912. This has a more robust stem than the type, and is more or less bristly, the leaves very deeply cut, the teeth near together, the nerves on the under side prominent; the branches of the inflorescence each provided with a glomerule with one very much smaller bract.

First found in Britain, I. M. H., 1908. See *Rep. B.E.C.* 333, (1913) 1914. On a waste-heap at a woollen mill at Galashiels, and on shingle by the side of the Gala near its junction with the Tweed, Selk. Flowering August to September. Det. A. Thellung.

2130 (3) *C. paniculatum* Hook. Bot. Misc. ii. 237, 1831.

S. America—Lurin near Lima, Peru.

Suffruticose, branched; leaves petiolate, ovate-triangular, acute, entire, farinose; panicle terminal, simple, patent, branched; clusters of flowers sessile.

First record for Britain: I. M. H., September 1916. Found in the vicinity of woollen mills, Selkirk.

2131 *C. Botrys* L.

Ic. Flora Graeca t. 253.

Through Central and South Europe, Thrace, Siberia, Arabia, Persia, Turkestan, Kashmir to Sikkim up to 3200 m., a weed in the fields in Tibet up to 4500 m., China, N. Africa—Egypt, Afghanistan, South Africa—Natal. Adventive in N. America.

Very aromatic, pubescent-glandular; stem erect, 3-6 dm.; leaves yellowish-green, broadly elliptic, pinnatifid, glandular-pubescent on both sides about half way to the midrib, the divisions obtuse; inflorescence dense, copious, forming oblong, leafless panicles, often 2 dm. long and 4-6 cm. broad, ultimate branches short, slender, minutely papillose and glandular, divaricate and zig-zag; perigone segments elliptic-triangular, with stalked glands but not mealy or hairy. The embryo encircles the albumen for two-thirds of a circle only, in *album* and most other species, it is quite encircled.



Fig. 57.

CHENOPODIUM HAYWARDIAE Murr.

First found on Tweedside, I. M. H., July 1909. On shingle by the side of the Gala near its mouth, Selk., also by the Tweed between Galashiels and Melrose, Roxb. Flowering July to October. See also J. Fraser in *Ann. Scot. Nat. Hist.* 46, 1900. Det. A. Thellung.

2131 × *C. Haywardiae* = *C. striatum* Kras. × *hircinum* Schrad. Murr in *litt.* and ex Rep. B.E.C. 334, (1913) 1914, nomen ; *l.c.* 19, (1914) 1915, tt. ii. and iii. and *Allgem. Bot. Zeit.* 25, 1914. Figs. 57 and 58.

Galashiels, Selk. (locus classicus). Found also (recently) in Switzerland at Basilea and Zürich (Thellung in *litt.*).

This hybrid, which Dr Murr spoke of as a "planta pulcherrima," is intermediate between the two above-mentioned species, differing from *hircinum* in the largely sinuate lobes having the medium lobe prolonged, the lateral lobes narrow erect, the leaves smooth, full green, the margin purple ; the stem purple striate ; the glomerules small, densely striately mealy. "Four or five examples of the beautiful new hybrid, *Chenopodium hircinum* × *striatum* mihi I have designated as *C. Haywardiae*. A *C. hircino* differt foliis largius sinuatis lobo medio magis protracto, lateralibus angustioribus erectis, foliis laete v. saturate viridibus margine purpureo, caule purpureo-striato. Glomerulis parvis ut in striato sed dense farinosis" Dr Murr. See *Allgem. Bot. Zeit.* ii. 1-2, Jan.-Feb. 25, 1914.

This interesting and previously undescribed plant was found by I. M. H. at Galashiels, Selk., in 1913, and Dr Murr named it after its fortunate discoverer. The point arises—were seeds of this hybrid brought from Argentina or did the crossing take place in plants growing at Galashiels? The latter view commends itself to the authors, since there is no doubt that plants under changed conditions are more likely to cross than when they exist under conditions to which they have been accustomed. *Sonchus asper* and *oleraceus*, which exist together in Britain in so many localities, have only very rarely been seen by the authors hybridising, yet we are told by Sir J. D. Hooker that in New Zealand many intermediates occur.

2131 (3) *C. hircinum* Schrad. Ind. Sem. Hort. Gott. 2, 1832.

C. bonariense Ten.

South America—Brazil, Paraguay, Uruguay, Argentina. Adventive in South Africa, M. & S. Europe—France at Port Juvenal 1846, Germany, Switzerland.

Stem herbaceous, erect, 6-20 dm., branched, subterete, pruinose, with green lines ; leaves long-stalked, foetid, sub-rhomboid-ovate, auriculate, cuneate at base, obtuse, mucronate, entire or sub-angulate-sinuate, thin, glabrous and pale green above, mealy and greyish-white below ; racemes paniculate-spicate, rather leafy,



Fig. 58.

CHENOPODIUM HAYWARDIAE Murr.

canescent; perigone covering the fruit, slightly keeled; seed shining, punctulate-rugose, margin obtuse.

First record for Tweedside: I. M. H. & G. C. D., August 1909. See *Rep. B.E.C.* 175, (1912) 1913. Found in 1917 in the vicinity of Galashiels Skin-works, at the junction of the Gala and Tweed, Selk., also by the Tweed near Melrose, Roxb. Flowering August to October.

I. M. H. has also found forms of *hircinum* at Galashiels in which the leaves are very deeply cut, and others in which they approach *ficifolium*. Others (forma *latifolia*) approach *opulifolium*. The hybrid *hircinum* \times *album* has also been found. See *Allgem. Bot. Zeit.* 25, 1914. This was found at the Skin-works and also at Galafoot, Selk., as well as lower down by the Tweed in Roxb.

Var. *SUBTRILOBUM* Issler in *Allgem. Bot. Zeit.* x. 43, 1904, not of Schultz.

Argentina.

First record for Britain: I. M. H., October 1913. See *Rep. B.E.C.* 334, (1913) 1914, and *Allgem. Bot. Zeit.* 25, 1914. Found during successive years in the vicinity of woollen mills at Selkirk. It differs very noticeably from other *Chenopodiums* in the small size of its leaves. Flowering August to October.

2131 (4) *C. Berlandieri* Moq. Enum. 23, 1840.

Britton & Brown Ill. Fl. North. U.S. etc., i. 572 (not good). A. & G. p. 81.

North America—dry soils, Missouri to Texas and Florida; Mexico.

Stem ascending, branched, slightly angled; leaves not foetid, small, ovate or ovate-oblong, acute, sub-mucronate, nearly entire, thin, mealy, glaucous, the base of the young, upper leaves often suffused with light purple, the lower sub-rhomboid, ovate or rhomboid; racemes lax, spicate, leafless; perigone not carinate, enclosing the fruit; seed punctulate-rugose, rather shining, acutely margined.

First record for Scotland: Galashiels, Selk., I. M. H., 1912. See *Rep. B.E.C.* 175, (1912) 1913.

Named after Jean Louis Berlandier, who collected in Mexico—Matamoros, in 1851. He monographed the *Grossulariae* for De Candolle's *Prodromus*.

Specimens approaching *C. album* were found in 1912 (but not *C. Zschackei*, which G. C. D. found at Par in Cornwall in 1908), and in 1913 I. M. H. gathered plants from Galaside, which Dr Murr thought were a form of \times *C. subcuneatum*, a hybrid of *Berlandieri* and *album*. See *Rep. B.E.C.* 334, (1913) 1914, and *Allgem. Bot. Zeit.* 73, 1913. Yet another "planta sat pulchra" he thought might be of the same parentage, his \times *C. texanum* Murr Bot. Lap. i. 8, 1902, but it was too young for precise identification. Others gathered in 1915 are almost certainly *album* \times *Berlandieri*, in which probaly the *album*



Fig. 59.

CHENOPODIUM ALBUM (L.) D.

parent is var. *viridescens* = *C. album*, var. *viridescens* × *Berlandieri*, forming a handsome plant. Another plant found at the Skin-works in 1915 Dr Thellung suggests comparison with var. *platyphyllum* Issler.

2131 (6) *C. ambiguum* R. Br. Prod. Fl. Nov. Holl. i. 407, 1810.

C. glaucum, var. *ambiguum* Hook.

Tasmania, New Zealand. Adventive in France (Port Juvenal, 1859), Germany and Switzerland.

Stem herbaceous, glabrous, not foetid, 2-10 dm., striate, sulcate, sparingly branched; leaves stalked, sometimes auriculate, rhomboid or lanceolate-rhomboid, repand, acute, sinuate-dentate, thin, glabrous, green and glabrous above, the margins sub-revolute, mealy and glaucous-white below; racemes in sub-simple, rather short, dense spikes; perigone nearly enclosing fruit; seed obtuse, smooth, shining; stamens 1.

First found in Europe, I. M. H., August 1911. See *Rep. B.E.C.* 175, (1912) 1913. By the banks of the Gala below Galashiels, and also at its junction with the Tweed, Selk. Flowering August to September.

2131 (7) *C. carinatum* R. Br. Prod. Fl. Nov. Holl. 407, 1810.

Salsola carinata Spreng. *Ambrina carinata* Moq. *Blitum carinatum* Moq. Fig. 59.

Australasia: Queensland—Moreton Bay, etc.; New South Wales—Port Jackson, Murray, Darling and Clarence Rivers, etc.; Victoria—Yarra-Yarra, Lake Torrens, Mount Lofty Range, etc.; West Australia; New Zealand—North and South Islands, but often adventive; New Caledonia. Adventive in Germany and Switzerland.

Stems much branched, procumbent or prostrate at base, ascending, from 2-5 dm., the whole plant more or less glandular-pubescent; leaves long-stalked, ovate or oblong, obtuse, coarsely sinuate-toothed, usually rather thick and rugose, glandular-scabrous on both sides, 1.25 to 2.5 cm. long, the upper floral ones often much reduced, and sometimes all the leaves almost orbicular and small; glomerules small, in dense globose clusters in almost all the axils, the upper sometimes forming interrupted, more or less leafy spikes; perigone-segments erect, incurved, broadly oblong, concave and almost boat-shaped, with a thickened, broad, obtuse keel, more or less pubescent or hirsute; stamens usually 1; fruit small, ovoid, erect, the pericarp inseparable from the vertical seed.

*First found in Europe, I. M. H., September 1911. See *Rep. B.E.C.* 175, (1912) 1913. Banks of the Gala, Selk., and by the side of the Tweed on shingle between Galashiels and Newstead, and on the embankment near Redbridge, Roxb. Especially abundant in 1913. Flowering September to October. Exhibited at the Linnean Society April 2, 1914.

213I (8) *C. graveolens* Willd. Enum. Pl. Hort. Berol. i. 290.

Mexico, Patagonia, Cape of Good Hope.

Aromatic, glandular, not mealy; stem 2-4 dm., sulcate, branched; leaves long-stalked, spreading, obtuse, deeply pinnatifid-sinuate, the lobes often sinuate-dentate, thin, glandular-pubescent, glaucous-green; racemes sub-spicate, rather lax, leafless; perigone completely enclosing the fruit, ecarinate; seed shining, margin acute, scarcely punctulate.

First found in Europe at the junction of the Gala and Tweed, Selk., I. M. H., September 1913. See *Rep. B.E.C.* 334, (1913) 1914, and *Allgem. Bot. Zeit.* 26, 1914. Rare. Flowering September.

213I (10) *C. vagans* Standley Fl. N. Amer. xxi. 26, 1916.

C. chilense Schrad., non Persoon.

Chile—Coquimbo, Valdivia. Adventive in Europe and N. California.

Aromatic, stem herbaceous, 3-4 dm., branched, angulate-striate, pale green, villous, with septate hairs; leaves shortly stalked, oblong, narrow, cuneate at base, unequally incised-serrate, thin, pale green, margin revolute, upper linear-lanceolate, dentate, uppermost entire, linear; racemes rather compact in slender leafy spikes; perigone completely enclosing fruit, ecarinate; seed sub-rostellate, occasionally vertical.

First found in Europe, I. M. H., September 1913. See *Rep. B.E.C.* 334, (1913) 1914. By the side of the Tweed near Galashiels, Selk., also on the shingle near Newstead, Roxb. Noticeable on account of its large leaves. The plants were only found in long warm summers, and then plentifully, but they seldom ever matured. Flowering September to October.

213I (12) *C. auricomiforme* Murr & Thell. in Mitt. Bot. Mus. Zürich lxxi. in Viertelj. Nat. Gesell. Zürich lx. 432, 1915. Fig. 60.

Geographical area: Probably Australia, but its exact native habitat is unknown. Of wool origin. First noticed in Switzerland in 1914 at the Dereningen wool-combing factory near Solothurn on a rubbish heap from Australian sheep's wool.

Planta herbacea, verisimiliter annua, robusta, 50 cm. alta, sub-glabra. Caulis viridi-striatus, praeter inflorescentiam fere glaber. Folia crassiuscula, juniora tenuissime farinosa, adulta fere glabra; caulina majora petiolo 3-4 cm. longo insidentia, 6-7 cm. longa, 4 cm. lata, anguste ovata, obtusiuscula, mucronulata, utrinque infra medium dente anguliformi valde prominente acutiusculo aucta, ceterum integerrima, basin versus marginibus convexis vel sub-rectis, ipsa basi tamen breviter cuneata; folia summa lanceolata acuta integerrima. Inflorescentia pyramidato-spicata, glomerulis in spicastra angusta densa subaphylla dispositis, axi inter glomerulos pilis albis tomentoso-villosulo. Flores flavi; perigonii



Fig. 60.

CHENOPODIUM AURICOMIFORME Murr & Thell.

laciniae (5) suborbiculatae, subglabrae, praeter partem medianam viridem flavae, margine subtiliter glanduloso-ciliatae; antherae (5) juniores luteae, defloratae pallidae. Cetera ignota.—Differt a *C. albo* floribus flavis, inflorescentiae axi inter glomerulos pilis elongatis villosulo nec tantum pilis brevibus vesiculiformibus farinoso-furfuraceo, a plerisque formis illius speciei insuper foliis (praeter angulos laterales) integerrimis simul cum inflorescentia spicata. Recedit a *C. auricomum*: planta subglabra, caule magis herbaceo (viridi-striato), foliis forma ad *C. album* accedentibus, utrinque angulo dentiformi auctis, perigonio subglabro nec tomentoso villosulo. Murr & Thell., *l.c.*

A plant, probably of this very recently described species, intermediate between *album* and the Australian species, *C. auricomum* Lindley, was found for the first time in Britain by I. M. H. in October 1914. See *Rep. B.E.C.* 208, (1915) 1916. Found near the Skinworks at Galashiels as a very large plant with distinctive leaves, but it was killed by the frost before the flowers appeared. Det. A. Thellung.

2132 (2) *C. anthelminticum* L. Wormseed (North America). Britton & Brown Ill. Fl. North. U.S., etc., i. 575 as *C. suffruticosum*. *Ambrina anthelmintica* Spach. *C. ambrosioides*, var. *anthelmintica* A. Gray.

Tropical and South America. Adventive but naturalised in North America—New York and Ontario to Wisconsin, south to Florida and Mexico. East Indies; Europe—Mannheim. Caribbean Islands.

This is closely allied to *ambrosioides*, but differs in the considerably broader, oval-oblong or oval-rhomboidal leaves (not lanceolate or oval-lanceolate), and by the panicle-branches being completely leafless, even of small bracts.

First British record: Galashiels, I. M. H., 1913. See *Rep. B.E.C.* 334, (1913) 1914. Near the junction of the Gala and Tweed, Selk., also along the Tweed to Melrose, Roxb. Flowering September to October.

This species or sub-species has on the Continent been often confused with the var. *suffruticosum* of *ambrosioides*.

507 ROUBIEVA Moq. in Ann. Sc. Nat. 2, sér. 1, 292, 1834.

The genus differs chiefly from *Chenopodium* in the finely divided, not mealy leaves, the perennial growth and vertical, not horizontal seeds. Named after G. J. Roubieu, a Montpellier botanist.

2135 *R. multifida* Moq., *l.c.*
Chenopodium multifidum L.

Central America, etc. Naturalised in Europe, but often only sporadic.

A stout perennial, 2-5 dm., diffuse or prostrate, green, with lanceolate or linear leaf divisions, which are entire or dentate; inflorescence in leafy spikes, forming a narrow, elongate panicle; perigone herbaceous with 5-fid divisions, pubescent, entirely covering the pentagonal, brown, shining, obtuse-bordered fruit.

First record for Roxb.: I. M. H., 1911. Large robust plants, found on an embankment by the side of the Tweed between Galashiels and Melrose.

507 (2) MONOLEPIS Schrad. Ind. Sem. Hort. Gott. 4, 1830.

A genus of 3 species, natives of W. North America, consisting of low, branching herbs, with small, narrow, entire, toothed or lobed leaves and polygamous or perfect flowers in small axillary clusters; calyx of a single herbaceous sepal; stamens 1; styles 2. The name comes from *mono*, one, and *lepis*, a scale.

2135 (2) M. Nuttalliana (R. & S.) Greene Fl. Francis. 168, 1891.

Blitum Nuttallianum Roem. & Schultes Mant. i. 65, 1822. *B. chenopodioides* Nuttall, not of Lamarck. Britton & Brown Ill. Fl. North. U.S., etc., i. 577, t. 1377.

Alkaline or dry soil, Manitoba and North-West Territory to Minnesota, Nebraska, New Mexico and California.

Plant slightly mealy, pale green, glabrous or nearly so when old; leaves lanceolate, short-stalked, narrowed at base, 3-lobed, the middle lobe linear or linear-oblong, acute, 2-4 times as long as the ascending lateral ones; flowers clustered in axils; sepals oblanceolate or spatulate; margin of seed acute. See Britton & Brown, *l.c.*

First found in Britain, I. M. H., July 1914. See *Rep. B.E.C.* 208, (1915) 1916. Rarely on the banks of the Gala below Galashiels Skin-works, Selk. Flowering July to September.

510 ATRIPLEX (Tourn.) L.

An unattractive but large genus of about 120 species [200 Dur.] widely spread round the coasts or in saline and desert tracts inland, or as weeds which follow man and his operations over a great extent of the globe, but chiefly in temperate, warm-temperate or sub-tropical regions. They consist of herbs or shrubs, often mealy-white or "scurfy-tomentose," differing essentially from the *Chenopodiums* in the flowers being monoecious, dioecious or rarely polygamous, the staminate perigone 4-5 partite, the pistillate 2-3, dentate or replaced by 2 bracts. The name is said to be derived from *a*, not, and *traphein*, to nourish.

2152 (2) Atriplex spongiosa F. v. Muell. in Trans. Vict. Inst. ii. 74.

A. semibaccata Moq., not of R. Brown. Figs. 61 and 62.



Fig. 61.

ATRIPLEX SPONGIOSA F. v. Mueller.

North Australia—Sturt's Creek ; South Australia—Lake Torrens ; West Australia.

A small, much-branched herb or undershrub, with numerous ascending or erect stems, not above 6 inches high, more or less mealy-white as well as the foliage or becoming glabrous when old ; leaves shortly petiolate, broadly ovate, obovate or orbicular, entire or sinuate-toothed, rather thick, $\frac{1}{4}$ to $\frac{1}{2}$ in. long ; flowers monoecious and axillary as in *A. holocarpa*, but much smaller and fewer together, the females mostly solitary or only 2 in each axil ; fruiting perigone enlarged, fibrous and spongy with a membranous epiderm, the inner membrane inseparable from the pericarp as in *A. holocarpa*, but much smaller, depressed, globular, not exceeding 2 lines in diameter, the small orifice closed by 2 minute, appressed, triangular valves ; seed of *A. holocarpa* with the radicle erect. See Benth. *Fl. Austral.* v. 179, 1870.



Fig. 62.

ATRIPLEX SPONGIOSA F. v. Mueller.

First found in Britain at Galashiels, I. M. H., July 1908. See *Rep. B.E.C.* 350, 396, (1908) 1909. Frequent in the vicinity of Galashiels Skin-works, also at the junction of the Gala and Tweed, Selk., and near the junction of the Ellwyn and Tweed between Galashiels and Melrose, Roxb. Especially plentiful in 1908 and 1910. The plants found were well branched with numerous

ascending or erect stems, not over 9 inches high, mealy-white, becoming glabrous when old. The berry-like, spongy fruit turns from a pale green colour to a dull red. The testa drops off, leaving the inner wiry reticulated membrane covering the ripened seeds. I. M. H. suggests that it is at this stage the fruits get entangled in the wool. Flowering July to September. Exhibited at the Botanical Society, Edinburgh November 1908, and at the Linnean Society December 1, 1910. Det. Prof. I. B. Balfour.

510 (3) BASSIA All. Misc. Taur. iii. 177, t.4, 1766, not of L. Mant.

Chenolea Thunb. Nov. Gen. 10, 1781.

2153 (20) B. quinquicuspis F. v. Muell. Census 30. *Roley Poley*.

Anisacantha quinquicuspis F. v. Muell. in Trans. Vict. Inst. 134, 1855. *A. muricata* Moq. Chen. 84. Benth. Fl. Austral. v. 199.

Queensland, New South Wales.

A broad, bushy or spreading shrub, 6-10 dm., with numerous, intricate, flexuous branches; leaves linear, flat, rather thick, mucronate-acute, contracted at base, 6-2.5 cm. long; perigone spines 5 or 4, one often very small, often the two smallest united at base. It is named after Ferdinando Bassi, once Curator of the Botanic Garden of Bologna.

First record for Britain: I. M. H., August 1913. Found by the banks of the Tweed between Galashiels and Melrose, Roxb. Det. A. Thellung.

Anisacantha muricata, as it is called in *Fl. Austral.*, is one of the rolling plants of the Darling and Murray deserts where the old plants, detached by the wind, roll over the desert plains and have received the name Roley-Poley. In *Ind. Kew. Bassia* of Allioni is put to *Chenolea*, a name first used fifteen years after *Bassia* had been established. The *Ind. Kew.* retains *Bassia* Koenig of 1771 for a Sapotaceous genus, properly the *Madhuca* of Gmelin.

73 POLYGONACEAE Lindley.

A large family best represented in the north temperate zone but practically world-spread, numbering about 800 species divided into 30 [D. T.] genera. They are mostly herbs or shrubs, some are woody climbers, and in tropical America a few are arborescent. The Rhubarb is one of the few edible plants of the order which, however, contains many other species with an acid juice. The medicinal Rhubarb is obtained from one or more species of *Rheum*, natives of Asia. The Buckwheat, extensively grown for its seed, is a species of *Fagopyrum*, but the order is not of great economic importance. Some species of *Polygonum*, *Muhlenbeckia* and *Rheum* are ornamental. The name is derived from *polys*, many, and *gonu*, a knee-joint, in allusion

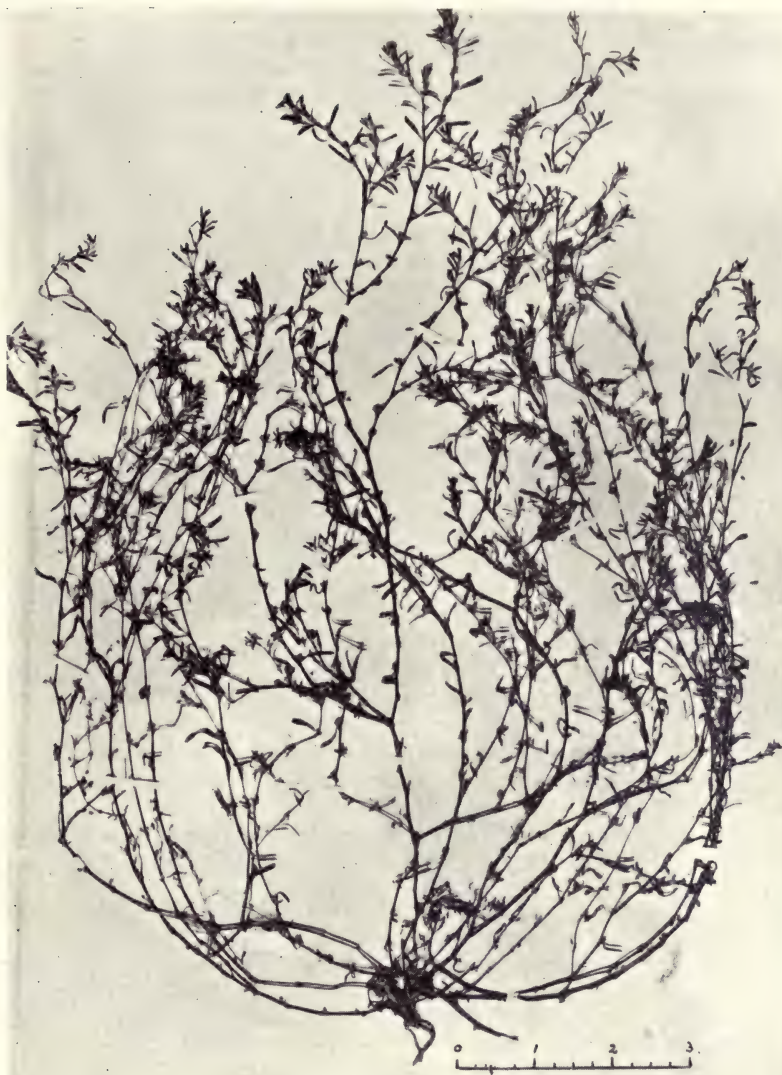


Fig. 63.

POLYGONUM PLEBEJUM R. Br.

to the many-jointed stem. The leaves are alternate; the stipules thin and scarious, brown or silvery, forming a sheath (ochrea) round the stem; flowers usually bi-sexual; perigone 3-6-partite; stamens 5-9; ovary free, with 1 erect, orthotropous ovule; styles 2-3; fruit a small seed-like, often triangular nut.

516 POLYGONUM (Tourn.) L.

A large genus of over 200 species, world-spread, herbaceous, rarely shrubby at base, or woody climbers, characterised by the wingless nuts, nearly equal leaves, and 4-5-partite perigone with nearly equal untubercled segments and entire, usually capitate stigmas.

2185 (3) *P. plebejum* R. Br. Prod. Fl. Nov. Holl. 320, 1810.

Fig. 63.

Egypt—Upper Nile; Lower Guinea, Mozambique, Afghanistan, Madagascar, South and tropical Africa, common over all tropical Asia, Java, Philippines, China, Queensland, New South Wales, Victoria, South Australia, New Zealand—North and South Islands from the sea level to nearly 1000 metres.

Allied to *P. aviculare* but differing in the smaller size (rarely over 3 dm. long), short, compact stem; the leaves mid-ribbed only, destitute of distinct lateral veins; the shorter perigone (under 2 mm.), the smaller smooth, shining nut, and ochrea more lacerate. In India the plant is very variable.

First found in Britain, I. M. H., September 1914. Doubtless of Australian origin. See *Rep. B.E.C.* 208, (1915) 1916. On the banks of the Tweed between Galashiels and Melrose, Roxb. Flowering August to September. Det. A. Thellung.

519 RUMEX (Tourn.) L.

A large genus of over 100 herbaceous or rarely shrubby, glabrous species, especially common in temperate regions, many being roadside weeds which follow man in his settlements. Pliny used the Latin name. Many plants have the leaves all radical and sometimes these, as in the garden Rhubarb, are of a great size. The perigone consists of three inner segments which enlarge and close over the fruit, the three outer much smaller, narrow and recurved; stamens 6; styles 3, shortly filiform, with large fringed stigmas; nut triangular, enclosed in the persistent perigone; flowers small, axillary or in terminal racemes or panicles; stipules at first entire, very soon becoming torn or jagged. *Rumex alpinus* is an alien in Britain. The large leaves are used for wrapping butter.

2205 *R. pulcher* L.

Fiddle Dock.

Syme E. B. viii. t. 1214.

In waste places, dry grassy slopes and roadsides throughout Central and S. Europe, W. Asia, N. Africa, Brazil.

Biennial or perennial, glabrous or nearly so, the first year's radical leaves in a rosette and distinctly fiddle-shaped, the mature plant with arching, flexuous, divaricate branches, up to 6 dm. ; leaves thin, subcordate or cordate, obtuse, crenate, broadly oblong ; leaves of the flowering branches linear and subsessile ; whorls remote, mostly leafy, in a lax, straggling panicle ; pedicels short, thick, abruptly recurved ; ripe petals strongly veined, the lower half with 4-8 strong, marginal, unequal spines, each with a prominent, roundish, lanceolate tubercle ; nut about 2 mm., ovate, triquetrous, nearly smooth.

From the frequent occurrence of this on Tweedside there is no doubt that it is a wool-alien, especially as some of the plants are not quite the same as our midland species.

Var. *DIVARICATUS* Mert. & Koch in Roehl. Deutsch. Fl. ed. 3, ii. 613.

This differs from the type in being clothed with strong hairs and in the leaves being less distinctly fiddle-shaped.

First record : *R. pulcher*, var. *divaricatus*, rubbish-heap, Kelso, Roxb., A. Brotherston in *Rep. Bot. Rec. Club* 252, 1877.

2207 *R. maritimus* L.

Syme E. B. viii. t. 1212.

Britain, Spain, France, Belgium, Holland, Norway, S. Sweden, S. Denmark, Germany, Austria, Hungary, Transylvania, Serbia, Russia, Taurus, Siberia.

Stem erect, 2-7 dm., rooting at lower nodes ; leaves long, linear, abruptly cuneate at base, entire or repand, subacute, yellowish-green, glabrous ; branches, erect, leafy to the top ; fruit-whorls many-flowered, approximate, often confluent ; petals bright yellow with spines 3 mm. long ; nut long, shining, trigonous, usually narrowed at each end, the faces elliptical.

First record for Tweedside : I. M. H., September 1911. Near the mouth of the Gala, Selk., and by the Tweed between Galashiels and Melrose, Roxb. Found plentifully in successive years. Flowering August to September. Recorded for Berwickshire in 1874, but not as a wool-alien.

2210 (4) *R. Brownii* Campd. Mon. Rumex 81.

R. fimbriatus R. Br. Prod. 421, 1810, not of Poiret. Fig. 64.

Australasia : Queensland ; New South Wales—Port Jackson, Newcastle, everywhere where sheep have been, Macleay River ; Victoria ; Tasmania—abundant in marshy places ; South Australia—Adelaide, Torrens River, Kangaroo Island.

A perennial with a thick rhizome and erect, simple or slightly branched stems, 3-6 dm. ; radical and lower leaves on long petioles, often cordate or hastate, oblong or obtuse, the stem leaves mostly lanceolate and acute, the floral ones reduced to



Fig. 64.

RUMEX BROWNII Campd.

small bracts or quite deficient; clusters remote, many-flowered, forming long, simple or slightly branched racemes; fruiting pedicels slender or thick, 1-3 lines long; inner segments of the fruiting perigone broadly triangular, $1\frac{1}{2}$ to 2 lines long, bordered on each side by 4 to 6 bristles, much hooked or almost involute at the end, the midrib prominent, but without any distinct tubercle. See Benth. *Fl. Austral.* v. 263.

First found in Britain at Galashiels, I. M. H., August 1908. See *Rep. B.E.C.* 350, (1908) 1909. Found in the vicinity of Galashiels Skin-works, thence along the sides of the Gala to its mouth, on woollen waste heaps at Selkirk, and along the Tweed for nine miles between Galashiels and Dryburgh, Roxb. This plant has been found so abundantly in successive years in the same places that it may be regarded as quite naturalised on Tweedside, where it roots deeply and bears fruit. Flowering September to November. Exhibited at the Botanic Society, Edinburgh November 1908, and at the Linnean Society December 1, 1910. Its seeds have been seen in Queensland and Adelaide wool. Named at Kew.

2210 (5) *R. halophilus* F. v. Muell. Fragm. iv. 48, 1863-64.

Australasia: North Australia—Gulf of Carpentaria; Queensland; New South Wales.

An erect, branching herb of about 1 foot, some specimens appearing annual; leaves linear or lanceolate, acute or obtuse, the lower ones on long petioles, sometimes cordate at the base, 2 or 3 or even 4 in. long, the upper ones small, but all or nearly all longer than the flower; flowers very small, very numerous, in dense, axillary clusters crowded on a great part of the plant; inner segments of the fruiting perigone sometimes under 1 line long, with long, fine points and marginal teeth, sometimes rather longer and broader, with shorter and more rigid points and teeth, always with a very prominent ovoid tubercle on the midrib. See Benth. *Fl. Austral.* v. 265.

First found in Britain, I. M. H., September 1911. See *Rep. B.E.C.* 355, (1913) 1914. On an embankment by the side of the Tweed below Galashiels, Roxb. Flowering August to September, fruits ripening well. Exhibited at the Linnean Society April 2, 1914.

This plant closely resembles the European *R. maritimus*, and may be a variety only, the chief difference being that the teeth of the fruiting perigone-segments, although fine and long, are always much less so than in the British plant.

2210 (8) *R. flexuosus* Solander ex Forster Prod. n. 515, 1786.

R. Cunninghamii Meissner. *R. Brownianus* A. Cunn., not *R. Brownii* of Forster.

New Zealand—Kermadec Islands and abundant through the North and South Islands.

A glabrous, perennial herb, with a diffusely branched stem, 6-18 inches high; branches grooved, slender, flexuous, divaricate; leaves chiefly radical, variable in size, 3-12 in. long, linear or linear-oblong, acute or obtuse, cuneate or truncate or cordate at base, rarely expanded or sub-hastate; margins flat or waved; panicle at first open, but in an advanced fruiting stage the branches are often numerous, spreading and intricate; whorls remote, 4-12 flowered, the lower ones leafy; peduncles joined near the base, curved, deflexed; inner segments of fruiting perigone about $\frac{1}{10}$ in. long, rhomboid, narrowed into a long, acuminate tip, reticulated, without tubercles; margins entire or more usually furnished with 1-4 hooked spines on each side. Cheeseman *Fl. N. Zeal.* 591, 1906.

First found in Britain at Galashiels, Selk., I. M. H., 1914. See *Rep. B.E.C.* 20, (1914) 1915.

Closely allied to the Australian *R. Brownii*, from which it differs mainly in the more diffusely branched habit.

2210 (10) *R. nepalensis* Sprengel Syst. ii. 159.

Boiss. *Fl. Orient.* iv. 1011.

Lydia, Taurus, Lebanon, Asia Minor, Bhotan to Kashmir up to 4000 metres; Nilghiris, etc., Malay, Java, China, S. Africa.

Perennial, tall, branched above with spreading branches; lower leaves large, oblong, ovate-oblong or triangular-ovate, cordate, upper sub-sessile, lanceolate, narrowed at base; racemes elongate, strict, whorls distant, leafy only at base; outer perigone segments orbicular-ovate, one or all with an oblong tubercle, broadly winged, the wing pectinately toothed, strongly reticulate, usually hooked at tip. This species is allied to *R. pulcher*. Its rough fruiting appendages readily adhere to sheep and cattle.

First found in Britain, I. M. H., August 1914. See *Rep. B.E.C.* 208, (1915) 1916. Vigorous well rooted plants occurred near the junction of the Gala and Tweed, Selk. Flowering August to September. Det. A. Thellung.

80 (2) URTICACEAE Reichb.

A family of over 500 species which are chiefly tropical herbs, shrubs or trees, with clear juice, and often stinging hairs. The species are of small economic importance except *Cannabis sativa*, from which Hemp is obtained. The Indian variety yields a narcotic, intoxicating, resinous substance called Bhang. The name is derived from *uro*, to burn. The flowers are 1-2-sexual, small, green; male perianth 3-8-lobed or 3-8-partite; female tubular or 3-5-cleft or a scale; ovary 1-locular, superior; style and stigma solitary, the stigma often tufted.

536 (2) *PILEA* Lindley Coll. Bot. t. 4, 1821.

A genus, chiefly tropical, of about 160 species. The plants are not stinging; the leaves opposite; perigone of the female flowers 3-partite,

one large segment with a gibbous apex ; glomerules of flowers in lax cymes or aggregated. The name is given on account of the cap-like nature of one of the divisions of the perigone.

2253 (10) *P. microphylla* (L.) Liebm. in Vidensk. Selks. Skr. v. ii. 302, 1851.

P. muscosa Lindley, l.c. *Urtica microphylla* Swartz.

Tropical America.

Stems filiform, a little succulent ; leaves entire, $1\frac{1}{2}$ -5 mm. long ; nerves inconspicuous, the stalk 1-5 mm., prominently pulvinate ; stipules absent or inconspicuous ; cymes small, axillary, usually sessile ; perigone segments short, thick, mucronate.

First found in Britain, I.M.H., September 1914. See *Rep. B.E.C.* 209, (1915) 1916. On the shingle at the junction of the Gala and Tweed, Selk. Flowering and fruiting freely August to September. Det. A Thellung.

MONOCOTYLEDONS.

91 LILIACEAE Haller.

A large and interesting family of about 2500 species and 200 [215 D. T.] genera of perennial herbs, rarely shrubs or trees, distributed over the world but more abundant in temperate and sub-tropical regions. The family is of great economic importance. Such vegetables as Onion, Garlic, Leek and Asparagus are yielded by it. One of the strongest fibres known is obtained from the New Zealand *Phormium tenax*. *Colchicum*, various species of *Aloe* and *Urginea Scilla* yield important medicinal remedies. *Veratrum album*, *V. nigrum* and *Cevadilla* yield irritant poisons. Some of the most beautiful plants are members of the same order, e.g., *Tulipa*, *Hyacinthus*, *Lilium*, *Fritillaria*, *Agapanthus*, *Hemerocallis*, *Funkia*, *Ornithogalum*, *Polygonatum* and *Convallaria*. The order is characterised by the 2-seriate perianth, usually 6-cleft or of 6 segments, petaloid, often coloured ; stamens 6, opposite the perianth segments ; ovary of 3 locules.

584 ASPHODELUS (Tourn.) L.

A small genus of 6-7 species, with roots of slender fibres ; rootstock of clustered fleshy tubers ; stem leafless, with leaves all radical ; perianth marcescent, the segments urceolate ; stamens hypogynous ; capsule globose-trigonal, coriaceous. The name is said to come from its being unsurpassable, i.e., *a*, and *sphallo*.

2390 *A. fistulosus* L.

Asphodel.

Ic. Flora Graeca t. 335.

Portugal, Spain, France, Italy, Adriatic coast, Greece, Turkey, Syria, Palestine, N. Africa, Canaries. Adventive in New Zealand.

Root fibrous, not much thickened; stem fistulous, 3-5 dm.; leaves fistulous, rush-like, narrow-linear; perianth whitish or dull rose, with elliptic-obtuse segments, the middle vein green or purplish; capsule globular-hexagonal, a little narrowed at base.

First record for Tweedside: I. M. H., September 1911. Banks of the Gala below Galashiels, Selk., and by the side of the Tweed between Galashiels and Melrose, Roxb. Flowering August to September. Det. G. C. Druce.

92 JUNCACEAE Dumortier.

Juncaceae Ventenat.

A family of about 300 species in 14 genera [9 D. T.] widely scattered in temperate and sub-tropical areas, consisting of annual or usually perennial plants, rarely shrubs, with a woody stem, usually leafy only at the base. They have no economic or medicinal value. Stems usually round; flowers inconspicuous, 2-sexual; perianth of 6 green or brown segments; stamens generally 6; capsule 3-valved.

601 JUNCUS (Tourn.) L.

A genus of about 200 species found chiefly in temperate and sub-tropical areas, often at great altitudes. Annual or perennial herbs; leaves terete or flat, glabrous; inflorescence terminal or apparently lateral, in lax panicles or more or less densely aggregated; perianth usually brown, the outer keeled or with a thickened midrib; ovary 3-locular with many parietal or axile ovules. The name is said to come from *jungo*, to bind.

2442 J. bufonius L., var. **grandiflorus** Schult. in Roem. & Schult. Syst. vii. 227, 1829.

J. bufonius Schult. ed. Thunb. Fl. Cap. Syme E. B. x. t. 1572. South Africa—Cape (!).

A more robust plant with larger flowers, the outer segments of the perianth elongate, often leafy, the median nerve green.

First record for Britain: I. M. H., September 1914. See *Rep. B.E.C.* 214, (1915) 1916. Found on the banks of the Gala below Galashiels Skin-works, Selk. Flowering August to October. Det. A. Thellung.

2442 (2) J. vaginatus R. Br. Prod. Fl. Nov. Holl. 218, 1810. New South Wales.

Allied to *J. pallidus* R. Br. (under which it is put in *Ind. Kew.*), which has a wider Australian distribution. Differs from *J. effusus* in the looser panicle, with rather long branched flowers, in the small cymes almost contracted into clusters at the base of the ramifications and ends of the branches; perianth small; stamens 6. See Benth. *Fl. Austral.* vii. 129.

First found in Europe on Tweedside, Selk., I. M. H., 1916.

2444 J. capitatus Weigel Obs Bot. 28, 1772.

Syme E. B. x. t. 1571.

Cornwall, Wales, France, Portugal, Spain, Italy, Belgium, Holland, Denmark, Sweden, Germany, Switzerland, Adriatic coast, Greece, Austria, Hungary, Transylvania, Turkey, Russia, N. Africa, Canaries, Azores.

Annual, very slender, 2-13 cm., with no rootstock; stem setaceous, leafless, furrowed; leaves shorter than stem; flowers 2-8, capitate; perianth segments slightly unequal, the outer longer, lanceolate, acuminate-aristate, recurved at tips, the inner all acute, pale brown, longer than capsule; stamens 3; capsule trigonous, mucronate, brownish-red; seeds very minute, ovoid, smooth.

First found in Scotland, I. M. H., August 1911. Banks of the Gala and also of the Tweed near Galashiels, Selk., extending into Roxb. Flowering August to September.

2448 (2?) J. sp. cf. uruguensis Griseb. in Goett. Abh. xxiv. 317, 1879.

Argentina.

First record for Britain: I. M. H., November 1915. Found growing in solid clumps by the side of the Tweed between Galashiels and Melrose, Roxb.

Dr Thellung reports "species mihi ex descr. tantum nota, specimina non suppetunt. A descr. discrepat capsula sepala superante, nec eis brevior. In herbario comparandus."

100 CYPERACEAE J. St. Hilaire.

A large family, found in all parts of the world, often occupying marshy places, and frequently gregarious, consisting of about 3400 species and nearly 170 genera [76 D.T.] of little economic or medicinal importance. The herbage is too rough and harsh to be useful for animal food. It consists of annual or more usually perennial species, resembling grasses, but differing essentially in the triquetrous stems, entire leaf-sheaths, basifixed anthers, undivided stigmas and trigonous or angled fruit.

626 CYPERUS (Mich.) L.

A large genus, of which nearly 800 species have been described, best represented in tropical and sub-tropical countries. The well-known *Cyperus antiquorum*, which yields the papyrus, *C. esculentus*, which is grown for the starchy material in its roots, and Galingale are almost all the plants of economic interest. The genus usually has the spikelets many-flowered, compressed or flat; glumes distichous, imbricate, the first and second empty; flowers bisexual; hypogynous bristles none;



Fig. 65.

CYPERUS CONGESTUS Vahl.

stamens 1-3; nut compressed or trigonous. *Cyperus* was the old Greek name.

2527 (2) *C. congestus* Vahl Enum. ii. 358, 1806.

Mariscus congestus C. B. Clarke in Fl. Cap. vii. 191, 1897. *C. polycephalus* Link. Rep. B.E.C. 215, (1915) 1916, t. 7. Fig. 65.

Turkey, Asia Minor, S. W. Asia, S. Africa: Cape—coast region; central region, Transvaal, etc.; eastern region, Pondoland, etc.; St Helena—Diana's Peak; Australasia. Adventive in France, 1842; Portugal, Switzerland, Germany.

Stem glabrous, 1.5-3.5 dm., without stolons, slender, trigonous at top, bearing a dense compound head of spikelets; spikes linear, many-flowered; glumes ovate, reddish with green or pale beak; leaves often as long as stem, broad, 4 mm., not transversely veined, weak, grass-like; sheaths of basal leaves inflated, scarious or coloured, forming an oblong thickening to the stem-base; bracts 3-4, similar to leaves, the lowest 7-18 cm. long; rachilla with broad, scarious, persistent wings, disarticulating below the lowest fertile flower. See Clarke, *l.c.*

First found in Britain, I. M. H., 1914. See Rep. B.E.C. 215, (1915) 1916. Abundant on marshy soil by the side of the Gala near Galashiels Skin-works, and also at the junction of the Gala and Tweed, Selk. Flowering August to October. Det. A. Thellung.

101 GRAMINACEAE Lindley.

One of the largest, and, from an economic point of view, one of the most important families, containing about 4000 species [3500 A. & G.] and 450 [315 Dur.] genera, distributed throughout the world, but best represented in temperate regions. Their herbage forms the main supply of food for cattle and sheep. From the cereals wheat, barley, oats, rice, rye, maize, and millet the chief food of man is obtained. *Saccharum* and *Sorghum* afford sugar, several species of *Andropogon* yield fragrant essential oils, Esparto-grass and other species are used for paper-making, while various Bamboos supply an infinite number of wants to the natives of the east. The stately Pampas Grass and graceful Bamboo are widely cultivated for their beauty. From their very ancient cultivation, with the accompanying range of variation induced, great difficulty is found in arriving at the actual home of certain cereals. The common weeds which form at once the food of animals and are at the same time carried by them wherever man settles are among the earliest to establish themselves and thus modify the indigenous flora. Grasses are extremely variable. Even the British species have a great range of variation, so that critical care is necessary in recording them. Hybridism is apparently rare. The family consists of annual, biennial or perennial herbs, rarely, as in the case of the Bamboos, shrubby or arborescent. The stem is cylindric or compressed, jointed, the internodes usually hollow; leaves alternate,

narrow, the sheath split to the base; flowering glumes boat-shaped; perianth wanting or replaced by 2-3 minute scales; stamens usually 3, rarely 1-2 or 6; anthers versatile, pendulous, fugacious; styles 3, feathery; fruit a seed-like grain.

635 *PANICUM* (Tourn.) L.

An overloaded genus of which over 850 species have been described but which may be reduced to about 300 good species, abundant in all hot climates, but rare or absent in cold northern areas. It consists of very different looking plants. Spikelets articulate on their pedicels or deciduous with them, 2-flowered, upper alone fruiting, bisexual, lower male or neuter, rarely both, fertile spikelets paniced or spicate, not awned (save *P. Crus-galli*); glumes 4; spikelets without bristles at the base of the fruit. *Panicum* was a plant name used by Pliny for *P. italicum*.

2632 *P. Crus-galli* L.

Barn-yard Grass (N. America).

Echinochloa Crus-galli Beauv. Syme E. B. xi. t. 1692.

A cosmopolitan weed throughout Europe except the extreme north, Caucasus, Arabia, Armenia, Persia, Beluchistan, China, throughout India, Egypt, S. Africa, Canaries. Adventive throughout North America except in the extreme north, New Zealand.

A somewhat coarse annual, 3-6 dm., with stem and sheaths compressed on the lower part; leaves flat, glabrous; ligule none; panicle 8-16 cm. long, unilateral; spikelets pubescent, usually awned and tinged with dark purple on the outer side, irregularly racemose, about 4 mm. long, rather closely aggregated; rachis hispid.

First record for Tweedside in flower: I. M. H., October 1915. Abundant in the vicinity of Galashiels Skin-works and by the banks of the Gala, Selk., and Tweed below Galashiels, Roxb. This may have come in with bird seed, but the bristly spikelets readily attach themselves to wool. See *Weed Fl. of Iowa*, f. 243. Det. G. C. Druce.

Var. *BREVISETUM* Doell, with awn nearly obsolete, also occurs.

2636 *P. miliaceum* L.

Red Millet.

Central Asia—Beluchistan, where it is called Azhdan and used for making bread. India, very largely cultivated and grown as Red Millet by the Khirgiz Tartars always on new land. When the chaff is removed it is used for human food. Cultivated in Lower Egypt, China and Japan since prehistoric times. Adventive in Europe, North America—Maine to New Jersey and Pennsylvania; Natal.

Annual, with a stout, erect or decumbent stem, 3-5 dm., glabrous or hirsute; leaves 10-20 cm. long, 0.75-2 cm. wide, more or less hairy; panicle rather dense, of many branches curved when unripe; spikelets long, acuminate; lower glume and upper glume of perfect flower nearly absent.

First record for Tweedside in flower: I. M. H., September 1911. Found on the banks near the mouth of the Gala, Selk., and on shingle by the side of the Tweed between Galashiels and Melrose, Roxb. Flowering in September. This again may be a bird-seed introduction. Det. G. G. Druce.

A grass, named with a query by Dr Thellung, *P. cf. laevifolium* Hackel, which is a native of South Africa, was found by I. M. H., October 1916, near the Galashiels Skin-works, Selk.

635 (2) MONACHNE Beauv. Agrost. 49, t. 10, 1812.

Eriochloa H. B. K. Nov. Gen. et Sp. i. 94, t. 30, 31, 1815. *Oedipachne* Link Hort. Berol. i. 51, 1827.

A genus of about 20 species, of which two are endemic to tropical South America, the others to tropical Asia and Africa. Spikelets one-flowered, involucrate; involucre setose, persistent; lower glume subulate-aristate; pales two, shorter than glumes; stigmas penicilliform. Allied to *Piptatherum*.

2637 (5) M. acrotricha (Steud.), comb. nov.

Eriochloa acrotricha (Steud.) Hackel ap. Schinz in Denkschr. Akad. Wiss. Wien. Math. Nat. Cl. lxxviii. 399, 1905. *Helopus acrotrichus* Steud. Nom. i. 747.

Tropical Africa and Australia.

Spikelets ovate, unilateral, subsessile or shortly stalked; glumes 3, the 2 outer empty, membranous; stamens 3; pedicels pubescent, hairy, setose or glabrous.

First found in Britain, I. M. H., October 1915. On the banks of the Gala below Galashiels, Selk. Det. A. Thellung.

636 SETARIA Beauv. Fl. d'Oware ii. 80, 1807.

This genus of about 10 species is named from *seta*, a bristle, alluding to the feature which distinguishes it from *Panicum*. The spiked spikelets have a one-sided involucre of bristles, which persists after the spikelet falls, and is variously barbed; inflorescence usually spicate. The species are spread, often adventitiously, over the temperate and tropical areas.

2639 S. viridis Beauv. Agrost. t. 9, 1812. *Green Foxtail* (U.S.A.).

Panicum viride L. *Ixophorus viridis* Nash.
Syme E. B. xi. t. 1593.

Throughout Europe, except the extreme north, but often only a weed; across all Asia—Siberia, China, Japan; Egypt, N. Africa. Adventive in North America, and often a troublesome weed.

Annual, variable in size, 1-5 dm., erect or spreading, often branched below, of a somewhat yellowish-green; panicle 12-75 mm., spike-like, of many spikelets; bristles of involucre 3-6, twice or thrice as long as spikelet, rough with upward-pointing prickles; glumes very unequal.



Fig. 66.

TRAGUS RACEMOSUS Scop.

First record : Between Melrose and Galashiels, Roxb., in considerable quantity, Stuart in *Proc. Berw.* 75, (1868) 1869. Kelso to Gala, Roxb., A. Brotherston, *l.c.* 137, 1873. Side of the Gala within the burgh of Galashiels, and on shingle near the junction of the Gala and Tweed, Selk., I. M. H. Flowering August to September.

2641 (2) *S. gracilis* H. B. K. Nov. Gen. et Sp. i. 109, 1815.

Panicum imberbe Poir. Enc. Suppl. iv. 272, Juin 1816.

S. America : Uruguay—Monte Video ; New Granada—between Fusagasaga and Pandi. Adventive in France in 1846.

Allied to *S. glauca*. Stem ascending ; spike filiform ; leaves rigid, pilose on the inner surface, margins scabrid ; involucre of many bristles ; spikelet solitary, shorter than bristles, about as large as a poppy seed ; glume whitish, glabrous ; lower pale of the hermaphrodite flower transversely undulate-striate, yellowish ; neuter flower two-paled, ovate-oblong, acute, glabrous, thin, membranous, greenish.

First found in Britain, Galashiels, Selk., I. M. H., October 1913. See *Rep. B.E.C.* 343, (1913) 1914. On an islet near the mouth of the Gala, Selk. Rare, but fully developed. Flowering September to October. Det. A. Thellung.

639 TRAGUS Haller Hist. Stirp. Helv. ii. 203, 1768.

Nazia Adans. Fam. ii. 31, 1763. *Lappago* Schreber.

A very small genus of two species, one South African, distinguished from the related *Panicum* and *Setaria* by the solitary empty glume of the neuter flower being coriaceous and covered with 5-7 spinous-uncinate ribs, enclosing the perfect flower ; spikelets compressed, usually 1-flowered ; flowering glumes never awned. *Tragos*, used by Pliny, is the Greek for goat.

2646 *T. racemosus* Scop. Introd. 73, 1777, et All. Fl. Pedem. ii. 241, 1785.

Cenchrus racemosus L. *Lappago racemosa* Honk.

Fl. Graeca t. 101. Fig. 66.

Spain, France, Italy, Adriatic coast, Switzerland, Austria, Hungary, Serbia, Transylvania, Greece, Turkey, Roumania, Macedonia, Caucasus, Beluchistan, Afghanistan, China, Canaries, N. Africa—Egypt ; S. Africa—coast, central, Kalahari and eastern regions ; Natal ; N. and S. Australia. New South Wales, Victoria, Queensland ; South America, Mexico, West Indies.

Annual or sub-perennial ; stems fascicled, densely leafy, geniculate, ascending from a decumbent base or wholly decumbent, slender, from 4-13 dm. long ; leaves linear, acute, with herbaceous, tumid sheaths ; limb short ; ligule formed of tufts of short hairs ; panicle often purple, sometimes violet or green ; spikelets eventually spreading.



Fig. 67.

PHALARIS ANGUSTA Nees.

First found in Selk., I. M. H., September 1914. In the vicinity of Galashiels Skin-works and at the junction of the Gala and Tweed. Flowering September to October. Det. A. Thellung.

642 PHALARIS L.

A genus of about 10 species mainly natives of the Mediterranean area, but widely dispersed as weeds. *Phalaris* is the name used by Dioscorides for a grass. The genus is distinguished by the spikelets which are shortly stalked and imbricated not being articulated on the pedicel below the glumes; upper flower bisexual with or without 1 or 2 male or rudimentary flowers below; outer glumes 4, the 2 lower sometimes small; glumes nearly equal, usually winged; fruit ellipsoid, compressed; inflorescence in an oblong spike or dense cylindric panicle.

2650 (2) *P. angusta* Nees ex Trinius Gram. 7, t. 78, 1828. Fig. 76. Nees Agrost. Bras. 391, 1829. Gay Hist. Chile Bot. v. 254, 1853. South America—Brazil, Peru, Chile, Uruguay; N. America—California. Adventive in S. and Central Europe.

Stem slender, 5-6 nodes; panicle narrow, cylindric, elongated, 5.7 cm.; spikelets denticulate on the wings only, lanceolate-obovate, compressed, sub-imbricate; outer glume papery, acute. Allied to *P. caroliniana* Walt. Fl. Car. 74, 1788 = *P. intermedia* Bosc.

First found at Galashiels, Selk., I. M. H., August 1913. Also by the Tweed below Galashiels as far as Melrose, Roxb. Flowering August to September. Det. A. Thellung.

2653 *P. minor* Retz. Obs. Bot. iii. 8.

Portugal, Spain, France, Italy, Adriatic coast, Greece, Thrace, Syria, Mesopotamia, Persia, Afghanistan, Beluchistan, plains of India, Kashmir to Nepal up to 1600 m., Egypt, Tripolitania, Canaries, Natal.

Annual; stem 3-5 dm., glabrous, simple, finely striate, with 6-7 nodes, the upper internodes the longer up to 10 cm.; sheaths shorter than the internodes, the lower tight, the uppermost more or less inflated; inflorescence greenish white, sub-globose to cylindric, up to 5 cm. long, truncate at base, rounded at top; glumes oval-lanceolate, glabrous, keel serrulate; neuter flower one, villous.

First found in Tweedside, I. M. H., August 1908. See *Tr. Bot. Soc. Edin.* 44, 1909. Near Galashiels Skin-works, Selk., and by the side of the Tweed between Galashiels and Newstead (5 miles), Roxb. Flowering August to October. Det. J. Fraser.

2654 *P. paradoxa* L.

S. Europe, W. Asia, N. Africa, Abyssinia, Canaries.

Annual, 2-4 dm., decumbent below; panicle cylindric, ellipsoid-obovoid, 3-5 cm. long, tapering at base, and with the sterile

spikelets on the lower branches often rudimentary, the base usually enclosed in the sheath; glumes lanceolate, acuminate-aristate, keel of the fertile spikelets acuminate-aristate, many-nerved, bordered on the upper part with an entire wing; glumes of the lateral spikelets 3-nerved, the upper half of the keel coarsely dentate. The glossy perfect flowers distinguish it from *P. minor*.

First found on Tweedside, I. M. H., September 1916. By the banks of the Gala, near Galashiels Skin-works, Selk. Of rare occurrence. Det. A. Thellung.

647 ALOPECURUS L.

A genus, of which about 40 species have been described, chiefly confined to the colder and more temperate regions of both the northern and southern hemispheres. The name is derived from the Greek words *alopek*, a fox, and *oura*, a tail, in allusion to the cylindric panicle. Spikelets flattened, jointed on the pedicel; outer glumes 2, sub-equal, boat-shaped, with prominent keel but not awned; flowering glume awned; pale or inner glume absent.

2663 *A. alpinus* Sm. Fl. Brit. iii. 1386, 1804.

Syme E. B. xi. t. 1524.

Scotland—in damp grassy spots on the higher mountains of Ross, Aberdeen, Banff, Inverness, Forfar, and Perth, ascending to 3900 feet, and descending to 2000 feet. In the southern hemisphere at Tierra del Fuego, Chile.

The Scottish plant is perennial, with short or long stolons, the stem simple, not rooting at the base; leaves bright green, strongly ribbed, not glaucous; ligule short and blunt; panicle oblong, cylindric, obtuse, 1.25-2 cm. long, dense, branches 4-6; spikelets short, silky; awn dorsal, sometimes absent; anthers yellow.

Var. *ROBUSTUS* mihi.

Plant 6-8 dm., intensely glaucous, ligule about 3 mm. long, blunt; leaves exclusive of sheath 12 cm. long by 6 mm. broad, very strongly ribbed, the ribs asperous with short bristles, intensely glaucous; sheath less inflated than in the type; panicle short for the size of the plant, about 2 cm. long by 8 mm. broad, very silky; awn prominent.

Found in a sewage tank at Galashiels, Selk., I. M. H., 1916. Det., as *A. alpinus*, by W. B. Turrill, 1918.

There can be little doubt that this striking plant, which at a distance suggests *Elymus arenarius*, is not of British origin, but has come from the Magellan or Chilean area: indeed, Dr Thellung suggested comparing it with *A. antarcticus*, which is figured in Hooker's *Flora Antarctica*, but that is a distinctly green plant. Hooker dwells upon the close relationship which *antarcticus*, *alpinus*, and *pratensis* bear to each other. Syme's var. *Watsoni* itself approaches *pratensis* and grows sometimes to 6 dm. high, but it is not glaucous.

2664 A. myosuroides Huds. Fl. Ang. 23, 1762. *Black Grass.**A. agrestis* L. Syme E. B. xi. t. 1699.

A weed of cultivation throughout Europe except the extreme north ; western and central Asia, N. Africa. Introduced into North America, New Zealand, and Australia.

This is known by the empty glumes being connate to or nearly to the middle, by the narrowly cylindric, flexuous, often purplish, glabrous or glabrescent, attenuated panicle, the branches bearing rarely more than a single spikelet.

Of frequent occurrence on the shingle of the Tweed and Gala. It may also have been introduced by other agencies than wool. It is recorded from Edenhall, Roxb., by A. Brotherston in *Rep. Bot. Rec. Club*, 1874, but not as a wool-alien.

2667 A. fulvus Smith Eng. Bot. t. 1467, 1805.*A. aequalis* Sobol. Fl. Petrop. 16, 1799. Syme E. B. xi. t. 1700.

In watery and wet places in Britain, Scandinavia, Portugal, Spain, France, Italy, Belgium, Holland, Germany, Switzerland, Austria, Hungary, Transylvania, Montenegro, Serbia, Roumania, Russia, Asia Minor, Bithynia, Djimil at 2600 metres, Siberia, Turkestan.

Plant geniculate, often with the lower part in water and the upper part resting on it ; stem and leaves glaucous ; awn inserted near the middle of and a little longer than the flowering glume, scarcely exceeding the pales ; anthers bright orange-scarlet. In the allied *geniculatus* the awns are distinctly longer than the pales and the anthers are at first yellowish-white or purplish, changing to a dull orange-brown.

First record for Tweedside : I. M. H., August 1912. By the side of the Tweed between Galashiels and Melrose, Roxb. Flowering July to September. A quite unexpected wool-alien. Det. E. Hackel.

648 STIPA L.*Stupa* A. & G.

A genus of about 130 [100 D. T.] species, usually tufted perennials with convolute leaves, found in the tropical and warm temperate regions, often as steppe-grasses. The feather grass of our gardens is *Stipa pennata* and the Esparto grass used for paper-making is *S. tenacissima*. Spikelets paniced, continuous with their pedicels, with a terminal perfect flower and one or more imperfect male or neuter flowers below it ; rachilla articulate at base, not produced beyond the third perfect flower ; flowering glume rigid or hard, strongly awned, the awn entire ; fruit terete. The name, more correctly *Stupa*, is said to be derived from its silky appearance.

2669 (2) S. Poepigiana Trin. & Rupr. in Mém. Ac. Pétersb. Sc. Nat. v. 29, 1842.

Rep. B.E.C. 27, (1914) 1915.

Q

Chilean Andes. This most interesting grass was discovered in the Chilean Andes in the Province of Antuco, a remote mountain district, by Poeppig. It does not appear to have been recently observed.

Panicles lax, coloured, half a foot, ascending; glumes acuminate, subequal, 5-7 lines; florets subcylindrical, white pilose up to the apex, setulose at the apex, $3\frac{1}{2}$ to 4 lines; awn caducous, shortly pubescent below, twisted, two inches and longer, straight for two-thirds of its length, then geniculate; anthers naked.

On wool-refuse at Selk., I. M. H., October 1913. First time in Europe. Prof. Hackel, the well-known authority, says he has "named it only on the authority of the (somewhat meagre) description in Trinius and Ruprecht *Spec. Gram. Stipaceorum*. It must be a very rare plant, because I do not find any mention of its having been collected by any other botanist than its discoverer, Poeppig. There is therefore some slight doubt left of the identification of the species, but surely there is no other described *Stipa* to which your specimen agrees better (the panicle of your specimen is reduced in size, not 15 cm.)." See *Rep. B.E.C.* 27, (1914) 1915. Flowering September to October.

2669 (3) *S. caudata* Trin. & Rupr. in Mém. Ac. Pétersb. Sc. Nat. vi. i. 75, 1831.

Rep. B.E.C. 28, (1914) 1915.

Chile, S. Argentina.

Panicles contracted; glumes subequal, $2\frac{1}{2}$ to 3 lines, sometimes caudate at the apex; lower valvule 2 lines, pilose, and at the apex crowned with many short bristles; awn persistent, flexuose, geniculate at the middle, 6 to 8 lines; anthers very shortly barbed.

Added to the European list by I. M. H., who gathered it on wool-refuse at Selkirk, October 1913. Professor Hackel, in naming it, says:—"As yet this has not been rediscovered in Chile, whence Trinius got it from Lindley (without indication of locality), but a somewhat stouter form or variety of it has been found in Southern Argentina. Your specimen agrees better with Trinius' description than the Argentina specimens do." Flowering September to October. See *Rep. B.E.C.* 28, (1914) 1915.

It is a remarkable fact that two such rare species should have germinated in Scotland from seeds cleansed from Chilean wool. Both are very beautiful grasses.

2669 (4) *S. brachychaeta* Godr. in Mém. Ac. Montp. i. 448, 1853.

Argentina, Uruguay. Introduced into France in 1850, and named by Godron in the *Flora Juvenal.* ed. i. 42, 1853, who at that time was unaware of its native home. M. Touchy found it in the same place in 1854.

It is allied to *S. splendens* Trinius, which differs in the smaller spikelets, in the valves of the glumes being acute, not aristate, and in the shorter and straighter awn. Perennial, caespitose, erect, rigid; nodes of stem glabrous, 6-9 dm.; ligules densely barbed; leaves glaucescent, elongate, canaliculate, glabrous or scabrous towards the apex, rigid, erect; sheath smooth; raceme elongate, erect, lax; spikelets 6-8, shortly pedicelled; glumes membranous, white-margined, lanceolate, acuminate, shortly awned; valves of glumes external greenish, attenuate at base and apex, clothed with soft white hairs, the awn long, twisted at base and geniculate.

This also was added to the British list by I. M. H., who found it on wool-refuse at Selkirk, October 1915. See *Rep. B.E.C.* 217, (1915) 1916.

2669 (5) *S. leptothera* Spegazz. in Ann. Mus. Monte Video iv. 11, 133.

Argentina.

A beautiful feathery-headed grass of a fine purple colour and silvery lustre; culms slender; leaves herbaceous, somewhat flat, smooth, long; panicle narrow, sheathing, erect or nodding; glumes lanceolate, longer than the floret, 3-nerved, greenish-violet; florets pubescent; callus small; awn deciduous, slender, 5 to 7 times longer than the florets.

First found in Europe by I. M. H., on a woollen waste heap, Selkirk, August 1914. See *Rep. B.E.C.* 217, (1915) 1916. Flowering August to September, and seeding freely. Named, with some slight doubt, by A. Thellung.

2669 (6) *S. Neesiana* Trin. & Rupr. in Mém. Ac. Pétersb. Sc. Nat. v. 27, 1842.

S. intricata Godr. Fl. Juv. ed. i. 41, 1853. *S. setigera* Spegazz. Stip. Plat. Thell. Fl. Adv. Montp. 94, vix Presl Rel. Haenke. 226, 1830. See Kew Bull. 206, 1916.

S. Brazil, Uruguay, Argentina.

Perennial, 3-10 dm., caespitose, erect, rigid; nodes pubescent; leaves linear, acuminate-subulate, canaliculate, ciliate, scabrous below; sheath smooth; ligule short, roundish; raceme lax, nodding, intricate, the branches thin, angular, scabrid; spikelets 3-5; valves of glume subequal, 3-nerved, brownish but with white margins, carinate, linear-lanceolate, acuminate, shortly awned; glumels with 5-nerved valves, the base covered with white, appressed hairs; awn twisted below, hairy, bent above the middle.

First found on the banks of the Gala below Galashiels, Selk., I. M. H., September 1916. See *Rep. B.E.C.* 431, (1916) 1917. Det. A. Thellung.

This interesting species was first found in Europe at Port Juvenal by Touchy in 1847, and it continued (teste Thellung *Fl. Adv. Montp.*

94) in the neighbourhood for a long period of years in the drying yards of Montplaisir near Lodève and Bédarieux on the river Orb, both in the Hérault. It was also found on the banks of the Polcevera, close to Genoa (Sommier in *Bull. Bot. Soc. Ital.* 115, 1904), near some tan works, which had hides from Argentina, and in inland Europe in Germany at the Rodleben Wool factory at Rossau, Anhalt, (Höck in *Beih. Bot. Centralbl.* xxvi. 430, 1910). At Nice it grew in great tufts, away from factories on the beach, below St. Hélène and Carras (Gouan in *Bull. Bot. Soc. Ital.* 149, 1909). In 1916 Mr A. T. Rake found specimens on a rubbish heap at Mortlake which were identified at Kew. In Argentina it produces fairly good fodder, but is very troublesome when in fruit, as the sharp, hard calli of the spikelets readily bore into the skins of animals, causing painful wounds. Hence the Argentina name of *Flechilla*, Little Dart.

648 (3) NASSELLA Desv. in Gay Fl. Chile vi. 263, t. 75, 1853.

A small genus of about 10 South American species, natives of Peru, Chile and Argentina, with spikelets one-flowered; glumes 2, subequal, 3 5-nerved, acute, keeled, exceeding the flower; flower articulate at the base, with a very short, obtuse callus; lower pale coriaceous, obliquely obovate, laterally compressed, gibbous, glabrous or pilose, smooth, margins subconvolute; awn lateral, deciduous, contorted; upper pale membranaceous, much shorter, concave, not nerved; squamules 3, obovate-truncate, the posticous narrower; stamens 3; anthers linear, pilose at the apex; ovary glabrous; styles short or scarcely any; stigmas plumose; caryopsis obliquely rounded-obovate, compressed, embryo large. Differs from *Stipa* in the large obliquely obovate flowering glume, tuberculate at apex, the awn excentric, promptly deciduous, and in its shorter and obtuser callus.

2669 (10) N. flaccidula Hackel in Fedde Rep. vi. 154, 1908, var. *glomerata* Hackel in *Rep. B.E.C.* 28, (1914) 1915. Fig. 68.

Geographical area of the species: Bolivia—La Paz.

Description of the species:—Perennial, caespitose; culms erect or geniculate-ascending, slender, 30-60 cm. high, 3-4-noded, terete, glabrous; sheaths terete, scaberulous; ligules oblong, about 2 mm. long, truncate, denticulate, ciliolate especially near the mouth of the sheath; blades linear, 15-30 cm. long, 1-3 mm. broad, flaccid, green, on the margins scabrid, with short hairs on the upper surface and 5 to 6 ribs; panicle spreading, rather dense, flaccid, nodding, 15-28 cm. long; spikelets lanceolate, 6-7 mm. long, variegated green and violet; sterile glumes subequal, equalling the spikelet, lanceolate, mucronate-acuminate, glabrous; fertile glume half the length of the sterile, obliquely subclavate-oblong; subterminal awn very slender, about 25 mm. long, loosely twisted; pale one-third shorter than the glume, ovate-lanceolate, glabrous; anthers 1.5 mm. long, barbate.



Fig. 68.

NASSELLA FLACCIDULA Hackel, var. *GLOMERATA* Hackel.

Var. *glomerata* differt a typo paniculae ramis in parte superiore ob spiculas densissime confertas fere glomeriformibus, arista circ. 12 mm. (in typo 22-25 mm.) longa. Spiculae e viridi et albo (in typo etiam violaceo) variegatae.

This most interesting grass was found for the first time in Europe on wool-refuse at Selkirk by I. M. H., October 1913, and a plate of it appeared in *Rep. B.E.C.* for that year. Prof. Hackel recognised it as an undescribed variety which he diagnosed as above and adds: "The species *flaccidula* is known only from Bolivia (mountain slopes near La Paz), but it is possible that it is only a form of the Peruvian *N. pubiflora* Hackel (*Urachne pubiflora* Trin.). [This plant] does not represent the typical form of the species. Besides the differences in diversities of habit, culm and leaves more slender, the spikelets paler of colour, attributable to the quite different climate of the Scotch station, there are also differences in the form of the panicle, length of the awn, etc., which perhaps may have already existed in the wild state, and which justify the distinction of varieties. But as to the species to which this belongs there is not the slightest doubt, and the fact of mountain species of the Andes reappearing as aliens [in Scotland] is beyond doubt." Miss Hayward found it again at Selkirk in 1916.

2669 (11) *N. caespitosa* Griseb. in Goett. Abh. xix. 258, 1874, var. *peruviana* (Ball in Journ. Linn. Soc. xxii. 58, 1885 as a var. of *Oryzopsis caespitosa*) Hackel in *Rep. B.E.C.* 28, (1914) 1915. *Stipa caespitosa* Spegazz.

The type is a native of mountain meadows in the province of Salta in W. Argentina. It has not been found in Chile, but it occurs in a somewhat different form at Chicha in the Peruvian Andes.

Caespitose, glabrous; leaves one to three inches long, convolute, setaceous, stiff, pungent-acuminate at the apex; ligule short, bilobed, rounded, pilose; panicle one to three inches long, four lines broad, narrow, purplish; sterile glumes oblong-lanceolate, acute, 3-nerved, one-third longer than the flower; fertile oblong, 5-nerved, truncate at the apex with a puberulous awn 2-3 times shorter; pale small; callus very short, barbate.

The var. differs in its larger size, laxer inflorescence and very short two-eared ligule.

First found in Europe on wool-refuse at Selkirk, I. M. H., September 1914. See *Rep. B.E.C.*, l.c.

Professor Hackel referred it with some hesitation to Ball's variety, not having seen a type specimen. He says perhaps it is a distinct variety of the very variable *Nassella caespitosa* to which, as an aggregate, it certainly belongs.

653 AGROSTIS L.

A large genus of over 100 rather beautiful species spread over the world, but best represented in temperate regions, and reaching from

the sea-level to great altitudes, often forming valuable pasture grasses, despite their somewhat thin herbage. The spikelets are usually small, in open or contracted many-flowered panicles; stigmas laterally exerted from the spikelets which are inarticulate; glumes usually thin and membranous, outer subequal, 1-nerved, awnless and persistent, flowering glume sometimes with a dorsal awn. The name, which was used formally to designate most grasses, is derived from *agros*, a field.

2683 *A. verticillata* Vill. Prosp. Hist. Plantes Dauph. 16, 1779.

Portugal, Spain, France, S. Italy, Adriatic coast, Greece, Taurus, Arabia, Beluchistan, Punjab, Kashmir, Simla at 1500 m., Egypt, N. Africa, Canaries, Azores. Naturalised at Finistère, Cherbourg, and Guernsey, where it was first noticed by G. C. D. in 1906. Adventive in Mexico and Cape of Good Hope.

Perennial, 3-6 dm.; stems geniculate, ascending or erect, sometimes rooting from the lowest nodes, glabrous, many and strongly noded; ligules scarious, short, truncate; leaves linear, tapering to an acute point, flat, glaucescent, scabrous; panicle erect, interrupted or lobed, very densely flowered, the branches short and bearing flowers to the base (in *alba* there is a naked space between the main axis and the lowest flowers on the branchlet); spikelets $1\frac{1}{2}$ mm. long, awnless.

First found at the mouth of the Gala, Galashiels, J. Fraser, August 1908. See *Tr. Bot. Soc. Edin.* 43, 1909. Plentifully by the banks of that stream and of the Tweed below Galashiels, Selk., I. M. H. Flowering August to October. Named by Prof. Hackel.

2689 *A. lachnantha* Nees in Ind. Sem. Hort. Bot. Wratislav. 1834, and in *Linnaea* x. 115, 1836. Fig. 69.

A. vestita Hochst. ex A. Rich. Tent. Fl. Abyss. ii. 401, 1847.

Abyssinia; S. Africa—coast region; Cape division—Lisbeck River; Tulbagh division, about the ponds at Salt River; Uitenhage division—in stagnant water by the Zwartkops River; Albany division—everywhere on the banks of streams; Cathcart division; Queenstown division—near Shiloh up to 1100 m.; central division—several localities up to 2800 m.; western region—Little Namaqualand, etc., Orange River Colony; Natal—common by streamlets.

Perennial or annual, glabrous; culms erect or geniculate-ascending, $\frac{1}{2}$ -2 feet long, smooth or scaberulous below the nodes, 2-4-noded; leaf sheaths minutely scaberulous; ligule $1-2\frac{1}{2}$ lines long; blades linear, tapering to an acute point, $1\frac{1}{2}$ -8 in. by 1-2 lines, green or sub-glaucous, flat, flaccid, scaberulous on both sides; panicle contracted, narrow, 2-12 in. long, erect, branches very unequal, in distant fascicles, the longest up to 4 in., or all very short, capillary, erect or flexuous, scabrid, branched from the base or the longer one simple for $\frac{1}{2}$ -1 in.; pedicels mostly as long as or



Fig. 69.

AGROSTIS LACHNANTHA Nees.

shorter than the spikelets, the latter light green, $\frac{3}{4}$ - $1\frac{1}{4}$ lines long, shining, rachilla not produced; glumes subequal, lanceolate, acutely sub-acuminate, keels rather stout, scabrid; valve oblong, truncate, $\frac{5}{8}$ -1 line long, hairy often only along the side nerves, rarely glabrous, 3-nerved, sometimes mucronate; callus scantily bearded; pale $\frac{1}{2}$ - $\frac{3}{4}$ line long; anthers $\frac{1}{4}$ line long; grain oblong, $\frac{1}{2}$ line long. See *Fl. Cap.* vii. 549.

This graceful grass was first found in Britain by I. M. H., October 1909. See *Rep. B.E.C.* 420, (1909) 1910, and J. Fraser in *Ann. Scot. Nat. Hist.* 46, 1910. Occurs within the burgh of Galashiels by the Gala to its mouth, among herbage, near Selkirk, Selk., and between Galashiels and Melrose by the Tweed, Roxb. Flowering August to October, plentiful and freely seeding. Det. Prof. Hackel and Dr Stapf.

654 POLYPOGON Desf. *Fl. Atl.* i. 66, 1798.

Santia Savi.

A small genus, named from *polys*, many, and *pogon*, awns, of about ten attractive species, four of which are American, one African, and the others widely dispersed over the warm areas of both hemispheres, one ascending to 3300 metres in Kashmir. The plants are annual or perennial with flat leaves; spikelets compressed; outer glumes subequal, awned, nerved; panicle usually spike-like, often lobed, disarticulating from the pedicels.

2690 *P. monspeliensis* Desf. *Fl. Atl.* i. 66, 1798.

Alopecurus monspeliensis L. *Santia monspeliensis* Savi, Parl.

Syme E. B. xi. t. 1713.

England, Scotland (?adv.), Portugal. Spain, France, Italy, Adriatic coast, Croatia, Greece. Adventive in Belgium, Holland, Switzerland, Macedonia, Transcaucasus, Arabia, Persia up to 2300 metres, Afghanistan, throughout continental India, ascending to nearly 3000 metres in Tibet, Ceylon, Japan, China. Adventive in S. Africa—common; Cape, Natal. Abyssinia, N. Africa, Canaries, Madeira, Australasia—New South Wales, Victoria, South and West Australia, Tasmania, New Zealand.

Annual, tufted, with erect or decumbent stems; leaves flat, scabrid; panicle very variable in size, of considerable beauty, spike-like, oblong or cylindric, rarely somewhat lobed; glumes 1 and 2 oblong, scaberulous, ciliolate, tip obtuse or slightly notched; awn silvery-white, from the sinus, 4-6 mm. long, two to three times as long as the glume, sometimes shorter and, as a rule, distinctly shorter than that of *maritimus*, which has also a more rigid looking panicle.

First record: Abundant from Melrose to Gala, Roxb., and Selk., Stuart in *Proc. Berw.*, 76, 1869-72. Gala, Selk., A. Brotherston in *Rep. Bot. Rec. Club* 1874. Found by I. M. H. since August

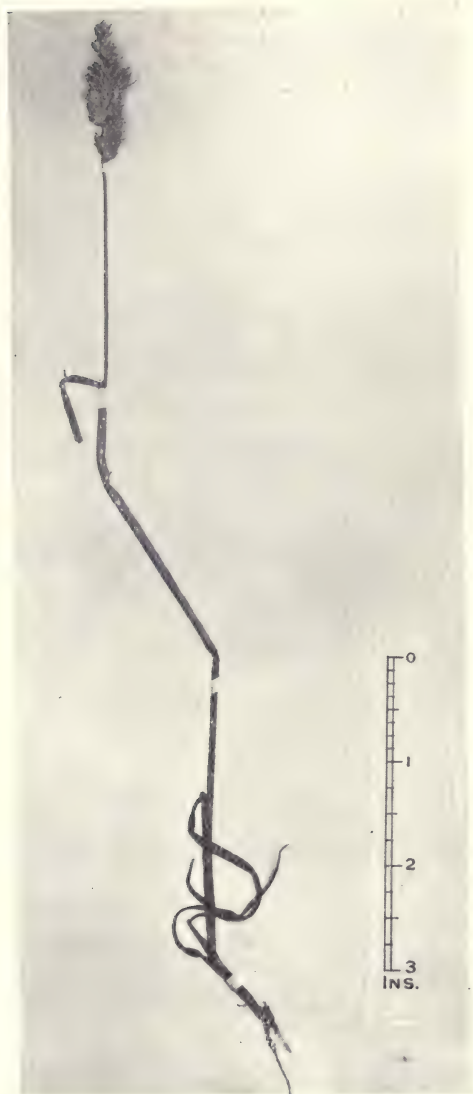


Fig. 70.

POLYPOGON LINEARIS TRIN.

1908 abundantly in various places from Peebles to Dryburgh and by the Gala below Galashiels. Flowering July to September.

Although this appears on the coasts of Britain as a native, there can be no doubt on Tweedside it is purely a lanal introduction, the scabrid awns readily adhering to wool and skins.

2690 (4) *P. linearis* Trin. in Linnaea x. 301, 1836.

P. longiflorus Nees. Gay Hist. de Chile, Atlas, 77, f.i. Fig. 70.

Chile—in the northern part near Concon (*Poeppig*), Valparaiso.

Annual, stem slender, 2-3 dm.; leaves flat, narrow-linear, margins denticulate, scabrid; ligule ovate-elongate; panicle erect, about 5 cm., narrow, cylindric; spikelets about 3 mm. long; glumes linear, the apex scarcely emarginate; lower glume with awn 4-5 mm. long; flowering glume much shorter; pales equal, truncate.

First found in Britain, Galafoot, Selk., I. M. H. and G. C. D., August 1909. See *Rep. B.E.C.* 420, (1909) 1910. It also occurs by the Tweed between Galashiels and Melrose, Roxb. Flowering August to October. Exhibited by I. M. H. at the Linnean Society December 1, 1913. Det. Prof. Hackel. Dr Lees found it near the Skin-works at Meanwood, near Leeds, in the same year.



Fig. 71.

POLYGONUM MARITIMUM Willd.

2691 *P. maritimum* Willd. Neu Ges. Nat. Fr. Berol. iii. 443, 1801.
Fig. 71.

Damp maritime sands in Portugal, Spain, France, Italy, Adriatic coast, Greece, Syria, Asia Minor, Beluchistan, Egypt, N. Africa, Canaries.

Annual, tufted, about 5-20 cm. high; panicle spike-like, oblong; glumes equal, the back beset with silvery scales below, margins ciliate, oblong-cuneate, bifid; awn three to four times as long as glume; flowering glume one-third as long as the empty ones, 4-toothed at top. The outer deeply cleft glumes distinguish it from its close ally *monspeliensis*, of which it is probably a sub-species.

A commonly occurring wool-alien on the shingle at Galashiels, Selk., where I. M. H. first detected it in August 1908. Exhibited at the Botanic Society of Edinburgh in 1909. Flowering August to October. Det. Prof. Hackel.

2692 *P. littoralis* Sm. Comp. Brit. Fl. 13.

? *Polypogon monspeliensis* × *Agrostis alba*. *Santia elongata* Parl. in Webb Fl. Canaries.

Syme E. B. xi. t. 1714.

England, France, Spain, Turkey, Abyssinia, Cilicia, India—from Kashmir to Bhotan and Manipur, W. Tibet—ascending to 3200 metres, Beluchistan, China, Canaries.

Perennial; rootstock creeping, producing tufts of stems and barren shoots; panicle greyish, often suffused with violet-purple, much lobed; awn only a little longer than glume.

First record: Bed of the Gala, Selk., Stuart in *Proc. Berw.* 76, 1869-72. Also found by I. M. H. up to 1916. This record shows it is a fertile hybrid, unless the crossing took place on the Tweed from the adventive *Polypogon monspeliensis* and native *Agrostis alba*. It has a curious distribution in India, where the local botanists do not suggest hybridity, and in China it is reported from many places where *monspeliensis* is not on record.

656 *DEYEUXIA* Clar. in Beauv. *Agrost.* 43, 1812.

A critical genus of over 100 species named after M. Deyeux, a celebrated French chemist, by many authors (as Durand) united with *Calamagrostis*, of which it has the habit, but from which it essentially differs in the rachilla of the 1-flowered spikelet being produced beyond the glabrous 3 glume and the callus hairs being usually short. The species are usually perennials, with spikelets in narrow or effuse panicles; glumes 1 and 2 lanceolate, acuminate, glabrous or scaberulous, glume 3 shorter, hyaline, awned; pale often very minute or 0; callus bearded with long or short hairs.

2697 (2) *D. retrofracta* (Willd.) Kunth Rev. Gram. { *Toothed Bent*
77, 1829, and Enum. 188, 1833. } *Grass.*

Avena filiformis Forster f. Fl. Insul. Austral. Prod. 9, 1786.
Agrostis Forsteri Roemer & Schultes Syst. ii. 359, 1817. *A. aemula* R. Br. Prod. 172, 1810. *A. Solandri* F. v. Muell. Veg. Chath. Isl. 60, 1864. *A. retrofracta* Willd. Enum. Hort. Berol.



Fig. 72.

DEYEUXIA RETROFRACTA (Willd.) Kunth.

94, 1809. *Lachnagrostis retrofracta* Trin. Fund. Agrost. 128. *Calamagrostis aemula* Steudel Syn. Glum. i. 192. *Agrostis debilis* Poiret Dict. Suppl. i. 249 and in Herb. Desf. Fig. 72.

Australasia: Queensland, New South Wales, Victoria, Tasmania, West Australia, South Australia, abundant in New Zealand—North, South, Chatham and Stewart Islands from sea level to 1000 metres.

A common grass, very variable in habit, usually erect or decumbent, 1 to 2 feet high or rather more; leaves flat, rather flaccid, but sometimes smaller with convolute or fine, almost filiform leaves; panicle usually very loose and spreading when fully out, 6 in. to 1 ft. long, with long capillary divided branches in distant whorls or clusters; spikelets very numerous; outer glumes narrow, very pointed, 1 to 1½ lines long or in some varieties nearly 2 lines; flowering glume about half as long, thin and almost hyaline, broad, enveloping the flower, truncate or very shortly and unequally 2 or 4 toothed, sprinkled or densely covered with hairs on the back, rarely almost glabrous, surrounded by the hairs of the rachis and with a fine twisted awn attached about the middle of the back; pale very narrow; rachis produced into a bristle, usually very short and ciliate with a few long hairs. See Benth. *Fl. Austral.* viii. 579, 1878.

First added to Britain by I. M. H. and J. Fraser. See *Ann. Scot. Nat. Hist.* 44, 1909. From the Tweed banks between Galashiels and Melrose, Roxb., August 1908. Afterwards found constantly and plentifully by I. M. H. along the banks of both Gala, Selk., and Tweed: indeed, this species, together with *Agrostis lachnantha* and *Polypogon monspeliensis*, were much the most abundant of the alien grasses found on Tweedsides in both counties. Flowering August to October. Exhibited at the Botanic Society, Edinburgh April 1909 and the Linnean Society December 1, 1910. Det. Prof. Hackel.

In *Useful Plants of Australia* (Forage Plants 83, 1889) Maiden refers to it as *Deyeuxia Forsteri* Kunth, the Toothed Bent Grass, and says it produces a large quantity of sweet fodder in damp localities, valuable in pastures. It is essentially a winter grass dying out on the approach of summer. Its percentage composition is:—Albumen 4.08, gluten 8, starch 1.34, gum 2.05, sugar 9.75. Its pointed seeds are very injurious to wool and frequently cause blindness in sheep.

657 GASTRIDIDIUM Beauv. Agrost. 21, 1812.

A small genus of two species, in which the rachilla is produced beyond the flowering glume; empty glumes large, boat-shaped (hence the name from *gastridion*, a ventricle); flowering glumes minute, 4-toothed; panicle dense, cylindric, spike-like; spikelets swollen, almost globular at base, one-flowered, with also a rudimentary one.

2698 *G. ventricosum* (Gouan) Schinz & Thell. in Viertelj. Nat. Ges. Zürich lviii. 39, 1913.

G. lendigerum Gaud. *G. australe* Beauv. *Agrostis ventricosa* Gouan. Syme E. B. xi. t. 1711.

England—rare and perhaps originally adventive, Portugal, Spain, France, Switzerland—Geneva; Italy, Adriatic coast, Greece, Turkey, Macedonia, Anatolia, Cilicia, W. Africa, Canaries, Madeira. Adventive in California, Chile, Tasmania, and New Zealand.

A rather pretty species from its glossy stem and panicle, which is lax during the flowering period but closed before and after; stems numerous, geniculate below; panicle branches semi-verticillate, some bearing spikelets to the base, others naked for half their length; spikelets 4.5 mm.; base of glumes swollen, shining, subcoriaceous; awn long, twisted.

First record for Scotland: In two or three places near Galashiels, Selk., Stuart in *Proc. Berw.* 79, 1869-72 as *G. lendigerum*. Found by the banks of the Gala below Galashiels, Selk., and by the Tweed between Galashiels and Melrose, Roxb., I. M. H., October 1913, and subsequent years. Flowering August to October.

658 *APERA* Adans. Fam. ii. 495, 1763.

A genus of two rather pretty annual species, chiefly differing from *Agrostis*, which it much resembles, in the rachilla being produced beyond the flowering glume; the panicle often large and graceful; the spikelets 1-flowered, small, shining; lower pale entire (hence the name from *aperos*, undivided), with an awn about three times as long; upper pale but little shorter than the lower.

2699 *A. Spica-venti* Reichb. Fl. Germ. Exc. 25, 1830.

Agrostis Spica-venti L. Syme E. B. xi. t. 1715.

Throughout Europe except the extreme north but not in S. Italy, Greece or Turkey. In Siberia, Taurus, Caucasus, N. Africa, Canaries.

A very beautiful species from its large effuse panicle of long-awned, glistening, greenish-yellow or purplish spikelets. The pales have two tufts of silky hairs at the base.

First record: In profusion in some places near Galashiels, Selk., Stuart, 1868, in *Proc. Berw.* 76, 1869-72. Kelso, Roxb., as a wool-alien, A. Brotherston in *Rep. Bot. Rec. Club* 1874. Gala side, within the burgh of Galashiels, and near its junction with the Tweed, Selk., onwards towards Melrose, Roxb., from 1908 to 1918, I. M. H. Flowering July to August. Det. G. C. Druce.

661 *AIRA* L.

Aera A. & G. Theophrastus.

A genus of about 10 species, with spikelets paniced, 2-rarely 3-4-flowered, the rachilla not produced beyond the flowering glume; glumes

4 or more, the two lowest empty, usually larger than the others; 2 or more flowering glumes with a dorsal awn usually bent and twisted. Loudon says the name, *Aira*, was applied by the Greeks to *Lolium temulentum*. It signifies something deadly, and has no reference to any of the species of the present genus.

2705 *A. capillaris* Host Gram. iv. 20, t. 35, 1809.

A. provincialis Jord. *A. elegans* Gaud. *Avena capillaris* Mert. & Koch.

S. Spain, S. France, Italy, Adriatic coast, Hungary, Bosnia, Rumania, Bulgaria, Serbia, Transylvania, Greece, Taurus, N. Africa.

A very pretty, graceful annual (hence the name) with upright, slender, fasciculate stems; sheaths rough; leaves filiform; ligules short, 2-3 mm.; panicle broadly oval, large; peduncles 3-5 times as long as the ellipsoid, very small, 1-1½ mm. spikelets; glumes sub-equal, pointed, the keel rough; lower pale awned, longly acuminate, bifid.

First found on Tweedside, I. M. H., August 1912. Among herbage on the banks of the Gala below Galashiels, Selk., and by the Tweed between Galashiels and Melrose, Roxb. Flowering July to September. Named at Kew.

666 AVENA L.

A genus of about 50 species, natives of the Mediterranean region, consisting of annual, flat, flaccid-leaved grasses with hyaline or scarious ligules; large, often loose, secund panicles of large pendulous spikelets; the grain grooved, subterete, hairy; the spikelets 2 or several-flowered; flowering glume generally shorter than the empty glume, usually armed with a geniculate and often twisted awn. *Avena* is the name for the oat, used by Vergil and Pliny.

2717 *A. fatua* L.

Wild Oat.

Syme E. B. xi. t. 1741.

Spread as a weed throughout Europe except the extreme north, and not given by Nyman (*Consp.*) for Greece or Turkey. It occurs throughout the cultivated areas of the world, as in South Africa, South Australia, Victoria, New Zealand, Beluchistan, Punjab, Sikkim, W. Tibet, N. Africa, Egypt, Canaries, North America—common.

This is very like the cultivated Oat, *A. sativa*, but the panicle is larger, usually more spreading, the florets all awned, the inner glumes shortly bifid, the lower pales darker, more hairy and more strongly nerved, the axis more brittle, so that the florets disarticulate more readily than in either *strigosa*, *sativa*, or *sterilis*. The latter species has much longer spikelets (in this they are 18-28 mm. long), and the rachilla is tough and glabrous between the glumes.

First record: A troublesome weed, Berw., Johnston, *N.H.* 217, 1853. Galashiels, Selk., I. M. H., October 1908. See *Tr. Bot. Soc.*

Edin. 43, 1909. By the side of the Gala within the burgh of Galashiels, and also near its junction with the Tweed, Selk. Flowering August to October. As the above is a frequent corn-field weed in Britain it should be stated that I. M. H. extracted seeds of *A. fatua* from Tasmanian wool and raised plants from them. A very pale-glumed plant, var. *albescens*, was also found by I. M. H. at Galashiels.

The more common plant of Tweedside shingle is the var. *pilosissima* S. F. Gray, in which the lower pales are densely clothed with hairs from the base to the insertion of the awn.

2718 *A. barbata* Brotero Fl. Lusit. 108, 1804.

A. fatua, sub-sp. *barbata* Rouy.

Spain, Portugal, France, Italy, Adriatic coast, Croatia, Greece, Turkey, Transylvania, Taurus, Transcaucasus, Babylon, W. Himalayas, Kumaon, N. Africa, Egypt, Canaries. Adventive in Cape Colony, Mexico, Argentina, Chile.

This species is considered by Dr Thellung to be the type of the cultivated *Avena strigosa*. It is characterised by the densely tufted growth of glabrous barren shoots; the usually nodding secund panicle; the spikelets 18-30 cm. long, 2-3-flowered, 2-3-awned; the rachilla villous, disarticulating between the 9-nerved glumes; the inner glumes strongly bifid, produced at the tips into long bristles (hence the specific name) with whitish hairs.

First record: Found at the junction of the Gala and Tweed, Selk., I. M. H., 1915. Flowering August to October.

A. sativa L., the common Oat, the botanical origin of which has been much debated, and the existence of which in a native state is unknown, occurs in considerable quantity from year to year by the Tweed in both Selkirk and Roxburgh, but one cannot say with certainty that any specimens are brought in wool. It is known by its upright panicle and by the inner glumes being scarious and somewhat coriaceous. The spikelets are all 2-flowered—in *A. nuda* they are 3-4-flowered, and it has herbaceous inner glumes.

2718 (2) *A. sterilis* L.

A. macrocarpa Moench Meth. 196, 1794.

Portugal, Spain, S. France, Italy, Adriatic coast, Austria, Transylvania, Greece, W. Asia—Syria, Persia, etc.; N. Africa, Madeira, Canaries. Adventive in Cape Colony.

Stem rarely with barren shoots; panicle loose, spreading all round or sub-second; spikelets 3-5 cm. long, with 2 awned flowers at base, and 1 or 2 rarely 3 awnless flowers above them; rachilla tough and glabrous between the glumes, but easily disarticulating above them; flowering glumes with long white hairs up to the middle; grain silky all over.

Var. *LUDOVICIANA* Gillet. *A. Ludoviciana* Durieu in Bull. Soc.

Linn. Bordeaux xx. i. 41, 1855. *A. sterilis* L., var. *minor* Coss & Dur. Exp. Alg. 109. *A. sterilis*, sub-sp. *Ludoviciana* Briquet.

This has a narrower area than the type—Spain, Italy—Verona; Greece, Algeria.

A smaller plant than the type, 3-6 dm., with spikelets only about half the size, 20-25 mm. long, usually with only two fertile flowers; the grain much narrowed at base. Named after Louis, the son of Durieu.

First found in Britain, Selk., I. M. H., October 1911. See *Rep. B.E.C.* 181, 1912 (1913). By the banks of the Gala below Galashiels, also at its junction with the Tweed, Selk. Flowering August to October. Det. Prof. Hackel.

670 CHLORIS Sw. Prod. 25, 1788.

A small genus, so called from *chloros*, green, of tropical or sub-tropical, attractive grasses with 1-flowered, awned spikelets in two rows on one side of the simple spikes; anther solitary or digitate at the end of the stalk; rachis articulated just above the glumes.

2729 (3) *C. truncata* R. Br. Prod. Fl. Nov. Holl. 186, 1810.

Queensland, South Australia, New South Wales—abundant in the west interior. Adventive at Constantinople, Hamburg, &c. Long cultivated in Botanic Gardens.

Stem 3-10 dm., erect, glabrous; leaves flat, narrow, with flattened sheaths; spikes digitate, slender, 7-15 cm. long; spikelets very obtuse, truncate.

First found in Britain, I. M. H., November 1915. Under shrubs in the vicinity of woollen mills near the Ettrick, Selk. Det. A. Thellung.

672 ELEUSINE Gaertn. Fruct. i. 7, 1788.

A small genus of about 7 species, natives of tropical Africa and Asia, having spikelets 1-many-flowered, crowded in two rows on one side of a flat rachis of a digitate inflorescence which is terminated by a spikelet. The name is derived from *Eleusis*, an appellative of Ceres, the goddess of grasses.

2731 *E. indica* Gaertn. Fruct. i. 8, 1797.

Cynosurus indicus L.

Tropics of Asia and Africa; Kermadec Islands of New Zealand, New South Wales, Queensland; common in Mexico and Central America and naturalised in the Mediterranean region, Thrace and Transcaucasus.

Annual, tufted, erect or decumbent at base, 1-6 dm. long, compressed, 2-3-noded, glabrous; leaves crowded near the base, distichous; ligules very small; spikes straight, slender, 2-10 cm. long, sessile

in a terminal umbel of 2-14 rays, sometimes with a few smaller spikes below; flowering glume lanceolate, oblong in profile, acute.

First found on Tweedside, I. M. H., 1916. On the banks of the Gala between Galashiels and the junction of the Gala and Tweed, Selk. Flowering November. Det. A. Thellung.

673 (2) DIPLACHNE Beauv. Agrost. 80, t. 16, 1812.

A small genus of about 15 species dispersed through the warm areas of the world, allied to *Triodia* and *Leptochloa* and distinguished from the latter by the elongate, slender, erect inflorescence. The name is derived from the Greek words for divided and chaff, the outer pale being divided at the end and bearded between the divisions.

2732 (2) D. Hackeliana Thell.

Robust plants with thick stems were doubtfully referred to this recently described species by Dr Thellung.

First record for Britain: I. M. H., September 1916. Abundant on the banks of the Gala about a mile below Galashiels, Selk.

676 (2) DANTHONIA Lam. & DC. Fl. Fr. iii. 32, 1805 p.p.

(United with *Sieglingia* by some authors).

This genus, named after Etienne Danthoine of Marseilles, of which about 150 species have been described, has a special development in Australasia, New Zealand, and South Africa. A few are found in South America, while others occur in both hemispheres. The plants are usually perennial; the leaves very variable; the spikelets 3-to many-flowered, laterally compressed, arranged in a lax or dense panicle, rarely simply racemose. They differ essentially from others of the *Avena* section by the awn, instead of being dorsal, being placed terminally between the rigid lobes or lateral awns of the glume. *Anisipogon* differs in having only 1-flowered spikelets.

2735 (2) D. semiannularis R. Br. Prod. } *New Zealand Oat-*
177, 1810. } *grass.*

Arundo semiannularis La Billardièr.

Australasia: abundant in temperate Australia; New South Wales—Port Jackson, Blue Mountains, etc.; Victoria—near Melbourne, Grampians; Tasmania—abundant throughout the Island; South Australia; West Australia; New Zealand—North, South, Chatham and Stewart Islands, in dry rocky places and poor soil, abundant throughout from sea level to 1400 metres. Now largely sown as a pasture grass in the northern part of New Zealand.

A very variable species, best distinguished from its allies by the two outer glumes being longer than the spikelets; stems 7-75 cm., usually glabrous; panicle 2.5-10 cm., narrow, compact; flowering glume with two dense transverse rings of silky hairs (hence the

specific name); central awn flat and spirally twisted at the base, 1.25-2.5 cm. long. It thus becomes easily entangled in the wool of sheep. Buchanan (*Indigenous Grasses from New Zealand* t. xxiv.) pays a high tribute to it as a pasture grass.

First found in Britain, I. M. H., October 1913. See *Rep. B.E.C.* 29, (1914) 1915. Found on a woollen waste heap at Selkirk; especially abundant in 1913. and still there in 1917. Flowering only in October. Exhibited at the Linnean Society April 2, 1914. Det. G. C. Druce and confirmed by A. Thellung.

2735 (3) *D. racemosa* R. Br. Prod. 177, 1810.

Australasia—New South Wales, Victoria, South Australia, Tasmania.

Stems slender, 3-7 dm.; leaves narrow, almost setaceous, rigid; spikelets single and very shortly pedicellate, or almost sessile and rather distant along the rachis of a simple raceme, but sometimes more approximate, and the lower pedicels with two spikelets, narrow, erect, under 1.25 cm. long; outer glume nearly as long; flowering glumes 6-8 or more, hairy at base and margins, glabrous or nearly so on back; lateral lobes in the type broad, with short fine points, but sometimes more awned.

First found in Britain, I. M. H., October 1913. See *Rep. B.E.C.* 29, (1914) 1915. Growing with the preceding species at Selk. Flowering October. Exhibited at the Linnean Society April 2, 1914. Det. Prof. Hackel and A. Thellung.

2735 (4) *D. nuda* Hook. f. Fl. Nov. Zel. ii. 337, 1867.

New Zealand—South Island from the sea coast to 1100 metres. The old record of Colenso in the North Island 70 years ago requires verifying.

Stem 7-22 cm., slender, tufted, quite glabrous; leaves much shorter than the stem, involute, filiform, glabrous; panicle 1.25-3.5 cm., small, of 5-15 spikelets; two outer glumes shorter than spikelet; flowering glume with two minute tufts of hairs on the margins, often confluent; awn very short, not twisted at base.

First record for Britain: I. M. H., September 1916. On the banks of the Gala near its junction with the Tweed, Selk. Fairly plentiful. Det. A. Thellung.

2735 (5) *D. pilosa* R. Br. Prod. 177, 1810.

New South Wales, Victoria—Melbourne, Black Forest, Deep Creek, Swan Hill; Tasmania—abundant throughout the island (*J. D. Hooker*); West Australia—Warren River, Kari Dale, Swan River; New Zealand—North, South and Stewart Islands, abundant up to 1300 metres.

Stems 3-6 dm.; leaves chiefly in radical tufts, very narrow, usually more or less hairy, the hairs sometimes long and spreading; panicle 2-10 cm., narrow, dense, almost as simple as in *racemosa*;

two outer glumes longer than spikelet; flowering glumes 6-8, with lanceolate lobes, tapering into fine awns almost as in *semiannularis*, but hairy on the margins only, without the transverse ring under the lobe of that species; awn long. See Hook. f. *Fl. Tasm.* ii. 120 and Benth. *Fl. Austral.* vii. 594, 1878. The plate of *D. pilosa* in Trinius *Gram.* i. v. 51, according to Bentham, represents *D. setacea* rather than *D. pilosa*.

First found in Britain, I. M. H., September 1916. On the banks of the Gala about 1 mile below Galashiels, Selk. Free-growing and plentiful. Det. A. Thellung.

677 LAMARKIA Moench Meth. 201, 1794.

(*Lamarckia* emend.).

The older name is *Achyrodes* Adans. Fam. 1763 and Boehmer in Ludwig Del. Gen. Pl. 420, 1790. A monotypic genus of the Mediterranean area, named after the eminent French botanist, Lamarck. It is one of the most beautiful grasses in the world from the dainty elegance of its glistening, golden-green panicle. It is a delicate, small, glabrous annual, with many stems and flat leaves; the fascicles of dimorphic spikelets, ebracteate, jointed on the branches, flexuous, loose, nodding; fertile spikelet quite hidden by the awnless spikelets, 2-flowered; sterile spikelet oblong, obtuse.

2736 L. aurea (L.) Moench Meth. 201, 1794.

Cynosurus aurea L. *Chrysurus aureus* Spr. *Achyrodes aurea* O. Kuntze. Fig. 73.

Portugal, Spain, France, Italy, Adriatic coast, Greece, Thrace, Asia Minor, Syria, Palestine, Persia, Afghanistan, Punjab, Tunis, Algeria, Morocco, Egypt, Abyssinia, Canaries, Madeira. Adventive at the Cape—coast region, Simons Bay. Casual in Australia and New Zealand.

First found on Tweedside, I. M. H., August 1908. Found by the side of the Gala within the burgh of Galashiels, also near its junction within the Tweed, Selk. Exhibited at the Botanic Society, Edinburgh April 1909. Flowering July to October.

679 KOELERIA Persoon Syn. i. 97, 1805.

A highly critical genus of 15 species [Dur.] named after Koeler, a professor of botany in Mainz. The species have usually the spikelets arranged in a more or less dense, spike-like panicle, occasionally lobed and open in flower; glumes 2, persistent, keeled, the lower usually 1-nerved, the upper 3-nerved, with hyaline margins; flowering glumes exceeding the empty ones, with margins and tips broadly hyaline, 3-5-nerved, middle nerve passing into a short sub-terminal awn; pales shorter than the flowering glume or nearly as long, 2-keeled, 2-toothed, very hyaline, white; stamens 3; fruit glabrous, laterally compressed, not furrowed.



Fig. 73.

LAMARKIA AUREA (L.) Moench.

2744 K. phleoides (Vill.) Persoon Syn. i. 97, 1805.*Festuca cristata* L., 1753, 1762. *F. phleoides* Vill.

France, Portugal, Spain, Italy, Adriatic coast, Greece, Bulgaria, Macedonia, Syria, Taurus, Caucasus, Arabia, Persia, Beluchistan, Afghanistan, Punjab Plains, Kashmir, N. Africa, Egypt, Abyssinia, Azores, Canaries, S. Africa—coast region. Adventive in Australasia—New South Wales, South Australia; Bermudas, North America, etc.

Annual; flowering glume bifid, awned (in the English *Koeleria gracilis* it is entire, not awned); stem 1.5-3 dm., erect or ascending; panicle 1.25-7 cm., cylindric, pale or dull green, sometimes lobed or branched at base; spikelets 3-4 mm., hardy, shining, the valve 5-nerved, finely awned or mucronate from below the tip. A variable species. See Domin *Mon. Koel.* in *Bibl. Bot.* xiv. 256, 1907.

First found at Galashiels, I. M. H., August 1908. On shingle at the junction of the Gala and Tweed, also by the Tweed between Galashiels and Newstead, Roxb., large plants. Det. A. Thellung.

Var. *BRACHYSTACHYS* Domin Mag. Bot. Lap. 334, 1904 p.p., and *Bibl. Bot.* 65, 267, 1907. *K. brachystachya* DC. Cat. Hort. Monsp. 120, 1813. *Trisetum phleoides*, var. *pumilum* Trin. ex Steudel Nomencl. ed. 2, 848, 1840.

France, Spain—Gibraltar, Sardinia, Morocco, S. Persia.

This differs in its geniculate, often more slender growth and smaller size; the panicle short, triangular-ovate in outline; spikelets 6-8 mm. long, always many-flowered, about 7 or up to 11-13; flowers always glabrous; flowering glumes awned from the apex or a little below the top.

First found in Britain, I. M. H., October 1911. See *Rep. B.E.C.* 37, (1911) 1912. On the banks of the Gala below Galashiels, Selk. A much smaller plant than the type. Det. W. B. Turrill and A. Thellung.

The forma *glabriflora* Tratv. also occurs.

2744 (3) K. panicea (Lam.) Domin in *Bibl. Bot.* 65, 292, 1907.

Avena panicea Lam. Ill. i. 202, 1791. *A. Loeftlingia* Lam., not of L. *A. neglecta* Savi. *Trisetum paniceum* Pers. *T. neglectum* Roem. & Schult.

Portugal, Spain, France, Italy, Istria, N. Africa, Canaries.

Annual, stem 1-4 dm., glabrous, more or less branched below; leaves linear, flat, acuminate, margins scabrous; panicle green, elliptic or cylindric, lobed, eventually contracted, with very many flowers which have no hairs at base; glumes rather unequal, 1-nerved.

First found in Britain, I. M. H., September 1913. See *Rep. B.E.C.* 344, (1913) 1914. Near the junction of the Gala and Tweed, Selk. A small but well-seeded plant, flowering August to September. Det. Prof. Hackel.

679 (2) AVELLINIA Parlatore Pl. Nov. 59, 1842.

A monotypic genus (or possibly of two or three species) confined to the Mediterranean region, with stalked, laterally compressed spikelets of 3-4 hermaphrodite, distant flowers and one rudimentary flower, arranged in a contracted panicle, with upright branches; glumes very unequal, lower very narrow, linear-lanceolate, 1-nerved, upper elliptic-lanceolate, 3-nerved, acuminate-cuspidate; inner glumes very unequal, lower enrolled-cylindric, 3-nerved, deeply toothed, each of the lobes provided with a bristle, the sinus between the lobes having a terminal awn; stamens 3; fruit narrow, cylindric, glabrous, not channelled.

2744 (10) A. Michellii Parlature, *l.c.* 61, 1842.

Bromus Michellii Savi. *Vulpia Michellii* Reichb. *Avena Michellii* Guss.

Portugal, Spain, France, Italy, Adriatic coast, Greece, Cyprus, Algeria.

Stems 1-3 dm., pubescent; leaves pale green, linear, acuminate, flat, slightly channelled, pubescent; sheath pubescent; ligule short, lacerate; panicle rather dense, with upright branches; spikelets 5-6 mm.; keel of the glumes rough, lower glume half as long as the upper with an awn about half its length, upper scabrid, bicuspidate.

First found on Tweedside, I. M. H., October 1913. On the banks of the Tweed between Galashiels and Melrose, Roxb. Flowering August to October. Det. A. Thellung.

679 (3) DISSANTHELIUM Trinius in Linnaea x. 305, 1836.

Phalarideum Nees. *Stenochloa* Nuttall.

A small genus of three Mexican, Californian and South American species. Panicle shortly pedunculate; branches short, erect; spikelets small; lower glume persistent, narrow, keeled, 1-3-nerved, acutely acuminate.

2744 (11) D. supinum Trinius, *l.c.*

South America—Andes of Bolivia and Peru, Mexico.

With the habit of a *Poa* but the lower valve is 1-nerved; spikelets 2-flowered; glumes equal, herbaceous, membranous, glabrous; caryopsis free; rachilla between the flowers glabrous.

First found in Europe, I. M. H., 1916. Banks of the Gala near Galashiels, Selk. Flowering August. Det. Prof. Hackel.

682 ERAGROSTIS Host. Ic. Gram. Austr. iv. 14, 1809.

A large, attractive and highly critical genus of over a hundred annual or perennial species, chiefly found in the warmer areas of the world. They are of very varying habit and offer serious difficulties in definition. Spikelets many-flowered; flowering glumes 3-nerved, entire, 3-toothed, 3-lobed or 3-awned; empty glumes shorter than the

lowest flowering glume; pale broad, membranous; stamens 2 or 3; fruit very small, globose, oblong ovoid or obovoid, free in the glume and pale. The panicles vary from loose to effuse, or are contracted to spike-like, or even become simple or compound spikes, with usually more or less olive-green or gray or more rarely bright pea-green spikelets, disarticulating in various ways, but rarely wholly deciduous. The name is derived from *eros*, love, and *agrostis*, grass, because of its graceful spikelets.

2748 (5) *E. chloromelas* Steudel Syn. Pl. Glum. 271, 1855.

E. atrovirens Nees Fl. Afr. Aust. 400, not of Trin.

South Africa: coast region—Queenstown, etc.; central region; Kalahari region—Transvaal, Orange River Colony; eastern region—Natal, near Van Reenens Pass to nearly 2000 metres. Adventive in France in 1871.

Densely tufted with closely packed innovation shoots; stems erect or geniculate, slender, simple, 1.5 to 4.5 dm., sub-compressed, usually glabrous and 2-noded, the uppermost very long; sheath bearded, the lower not or only very slightly compressed; ligules a fringe of short hairs; leaf-blade very narrow, filiform-convolute, capillary above, flexuous, 7.5 to 15 cm. long, 1-2 mm. broad, glaucous; panicle open, ovoid or pyramidal, lax, 5-20 cm. long, erect, rather rigid, lower branches in whorls of 5-3 or 2, adnate, rarely all solitary, spreading, finely filiform; pedicels capillary; spikelets scattered, linear, acute, 4-8 mm. by 1-1.5 mm., loosely 5-13-flowered, dark olive grey to slate grey; valves not variegated, obtuse. See Dyer *Fl. Cap.* vii. 602.

First found in Britain, Selk., I. M. H., 1915. See *Rep. B.E.C.* 218, (1915) 1916. Found on the banks of the Gala below Galashiels, Selk. Rare. Flowering September. There also in 1916. Det. A. Thellung.

687 BRIZA L.

A small genus of about 12 beautiful species. The name is derived from the Greek word *britho*, to balance, in allusion to the pendulous spikelets. These are usually arranged in an open panicle, laterally compressed, open during flowering, ovate; glumes inflated, awnless, closely imbricate, many-nerved; stamens 3; styles 2, short, persistent; fruit adherent to the upper pale, glabrous, roundish-ovate, convex outside, concave within.

2755 *B. maxima* L.

Portugal, Spain, France, Italy, Adriatic coast, Croatia, Greece, Turkey, Macedonia, Asia Minor, Syria, Palestine, N. Africa, Canaries, Madeira, Isle Bourbon. Adventive in Cape Colony—common, and in the Channel Isles, Belgium, Germany, etc., India, Australasia—New South Wales, South and West Australia.

A very handsome, annual species, 3-5 dm. high, erect ; leaves linear, acuminate, flat, roughish ; panicle unilateral, simple, erect or slightly nodding ; branches with 1-2 spikelets, which are large, oval-subtriangular, 1-2 cm. long by 7-10 mm. broad, shining, silvery-white or reddish, of from 5-15 flowers ; fruit adherent and concave on the inner surface.

First record : Galashiels, Selk., I. M. H., August 1912. In the bed of the Gala within the burgh of Galashiels, Selk. Flowering July to September. Seen from 1912 to 1917.

2757 *B. minor* L.

Syme E. B. xi. t. 1775.

In the south-west of England, the Channel Isles and southern Europe, extending through Transcaucasus, Asia Minor and Syria, absent from India, but appearing in China and Japan, N. Africa, Canaries, Azores, Madeira. Adventive in central Europe, the coast region of Cape Colony, New South Wales, Victoria, Tasmania, South and West Australia, New Zealand.

A very pretty, light-green annual with tufted flower stems ; panicle compound, lax, the branches bi-trichotomous, widely divaricate ; spikelets small, 4 mm. long, triangular-suborbicular or ovate-deltoid, 5-9-flowered.

First found at Selk., I. M. H., August 1908. See *Tr. Bot. Soc. Edin.* 43, 1909. On shingle by the side of the Gala near Galashiels, also near its junction with the Tweed, Selk., and by this stream near the inflow of the Ellwyn, Roxb. Abundant. Flowering August to October.

688 *POA* L.

A large genus, including some of our best pasture grasses, most richly represented in the temperate regions of the northern hemisphere, where it has a great altitudinal range. About 200 species have been enumerated. Spikelets 2-6-flowered, in lax or close or rarely spike-like panicles, laterally compressed ; glumes 4 or more, usually herbaceous, keeled, 5-nerved, the nerves nearly meeting at the tip, awnless ; stamens 3 ; stigmas plumose. The name was used by Theophrastus for a grass.

2760 *P. palustris* L.

P. serotina Ehrhart. *P. fertilis* Host. *P. triflora* Gilib.

Scandinavia, Holland, Belgium, France, Germany, Switzerland, N. Italy, Austria, Hungary, Transylvania, Montenegro, Serbia, Greece, S. and M. Russia. Often adventive as in Scotland, England, etc.

Perennial, stems 5-10 dm. ; leaves narrow-linear, flat, longly attenuate ; ligule oblong, acute ; panicle large, often very lax ; spikelets green or tinged with violet, ovoid, 2-7-flowered ; flowers with a tuft of woolly hairs at base ; lower pale obscurely 5-nerved, hairy on the keel and margins towards the base.

First observed at Galashiels by the Tweed, Selk., I. M. H., August 1913. Banks of the Gala, Selk., and also by the Tweed between Galashiels and Melrose, Roxb. Plentiful. Flowering September to October.

The var. *glabra* Ascherson Fl. Brandenb. i. 804, 1866, also occurs. See *Rep. B.E.C.* 29, (1914) 1915.

2769 *P. annua* L., var. *exilis* Tomm. ap. Freyn in Z.-B.G. 469, 1877.

P. remotiflora Murb. Cont. Fl. N.-O. Afr. 3, f. 4, 22, non Ruprecht.

The type is a ubiquitous, world-spread annual. The variety is native is S. Europe in the Mediterranean region, Persia, Syria, N. Africa, Channel Isles, etc., and differs from the type in the longer and narrower spikelets, usually 5-6 rarely 1-flowered, the upper, usually female, small, $1\frac{1}{8}$ -2 mm. long (not $2\frac{1}{2}$ to 4 mm.), the lower hermaphrodite, $2-2\frac{1}{8}$ mm. (not $2\frac{1}{2}$ to 4 mm.), the terminal a quarter or a third longer than the pedicel (not twice as long); staminal filament short, the anther very short, 0.35-0.40 mm. (not 0.60-0.80 mm.).

Found for the first time in Scotland, I. M. H., October 1916. Banks of the Gala below Galashiels, Selk. Flowering October.

It was found in Guernsey by G. C. D. in July 1906 and named by Hackel in *litt.* *P. annua*, forma *conferta*.

690 FESTUCA (Tourn.) L.

A very large and highly critical genus of which about 250 species have been described. They are world-spread and often reach the high limits of vegetation. Many of them are admirable pasture grasses. They are closely related to *Poa*, but the spikelets usually have a larger number of flowers, and are more oblong, while awns, more or less muticous, are usually present. The name is said to be derived from the Celtic word *fest*, a food.

2779 *F. rigida* Kunth.

Poa rigida L. *Scleropoa rigida* Griseb. *Glyceria rigida* Sm. *Sclerochloa rigida* Link. Syme E. B. xi. t. 1758.

Britain, Portugal, Spain, France, Italy, Belgium, Holland, Switzerland, Germany, S. Austria, Adriatic coast, Greece, Turkey, Taurus, Syria, Asia Minor, Persia, Egypt, Tunis, Algeria, Morocco, Canaries. Adventive in Cape Colony and New Zealand.

A neat, tufted, rigid annual, without barren shoots, 5-30 cm.; ligule hyaline; panicle rigid, distichous, unilateral, rather dense, triangular-oblong or linear-oblong; branches not jointed; spikelets awnless, rather numerous, 5-10-flowered, unilaterally, distichously and racemosely arranged on the lower panicle branches; glumes sub-cylindric, spreading, imbricate when closed or when open, linear, flat, green or frequently purplish or purplish-brown.

That it is a wool-alien is pretty certain from the manner of its occurrence on the shingle of the Tweed where it was first noticed by A. Brotherston in 1876, and found by I. M. H. on the banks of the Gala, Selk., and Tweed, Roxb. Whether it is brought in English wool or from Spain or S. Europe is difficult to say.

As will be seen by the quoted synonyms, much difference of opinion has existed as to which genus this common English limestone species should belong. Bentham and Hooker have been followed here in treating it as a *Festuca* belonging to the section Catapodium.

2787 (2) *F. trachylepis* Hackel in Rep. B.E.C. 29, 1914.

F. dumetorum Phil., not of L. Fig. 74.

Chile?

This interesting grass, new to science, was found by I. M. H. on a woollen waste heap at Selkirk in October 1913. Professor Hackel (*in litt.* to G. C. D.) says: "Surely this is one of the numerous Chilean species imperfectly described by Philippi, and comes very near to *F. dumetorum* Phil., not of L. I propose to name it *F. trachylepis*, but it has not the minute prickles on the fertile glume of that species."

The war has prevented any communication with Professor Hackel, and the description of the species is still awaited.

2788 *F. membranacea* Druce (not of Kit.) in Ann. Scot. Nat. Hist. 229, 1906.

F. uniglumis Sol. in Ait. Hort. Kew. i. 108, 1789. *Vulpia uniglumis* Dum. *Stipa membranacea* L. *Vulpia membranacea* Link. *V. uniglumis* Dum. Syme E. B. xi. t. 1779.

England, Ireland, France, Belgium, Spain, Portugal, Italy, Adriatic coast, Greece, Syria, Egypt, N. Africa.

The name, *uniglumis*, is a misnomer. The second glume is present, but is sometimes minute. This native of the sandy coasts of the Mediterranean is a beautiful annual species, without tufts of radical leaves; stems upright from a geniculate base, 7-30 cm.; panicle very unilateral, 3½-8 cm. long; spikelets thickened upwards, 3-6-flowered, erect; glumes very unequal, lower often very minute; lower pale with purplish or white awn, longer than itself.

First record: In the beds of the Gala and Tweed, Stuart in *Proc. Berw.* 80, 1869-72. New to Scotland.

This and *Festuca ambigua*, *Myurus* and *bromoides* belong to the section or sub-genus *Vulpia*, which contains annual, not perennial species, having spikelets subsecund in spike-like or racemose, contracted panicles; pedicels clavate, very short; lower glume very much smaller than the upper, often very minute or reduced to a scale; lower pale with an awn longer than itself.



Fig. 74.

FESTUCA TRACHYLEPIS Hackel.

2790 *F. ambigua* Le Gall Fl. Morbihan 731, 1852.

F. Danthonii A. & G., var. *ambigua* (Le Gall) Druce Brit. Pl. List. *F. ciliata* Pers., var. *Vulpia ciliata* Link Hort. Berol. i. 147, var. *glabra* Towns. *Vulpia ambigua* A. G. More in Journ. Linn. Soc. v. 161, 1890. Sub-sp. *Festuca Myurus* L., var. *ambigua* Hook. f. Stud. Fl. 1870. Syme E. B. xi. t. 1780.

England, Channel Isles, France, Portugal, Spain, Italy, Adriatic coast, Greece, S. Switzerland, S. W. Asia to Persia, N. Africa, Canaries.

It resembles *bromoides*, but differs in the longer awns; in the uppermost sheath reaching nearly to the panicle, which occupies from one-third to one-half of the whole stem, and in the panicle being dense, continuous, semi-cylindric, distichously unilateral, slightly branched at the base only. Spikelets 3-7-flowered, at first pale green, soon changing to reddish or purplish-brown; awns pale brown. The lower pale is not ciliate as in *Vulpia ciliata*, but punctate-scabrous.

First record: Side of the Gala, Selk., many plants in July 1873, A. Brotherston in *Proc. Berw.* 137, 1873. See *Rep. Bot. Rec. Club* 79, 1874. Several plants at Galafoot, Selk., I. M. H. See *Tr. Bot. Soc. Edin.* 44, 1909.

2791 *F. bromoides* L., var. *tenella* (Boiss.) comb. nov.

F. sciuroides Roth, var. *Vulpia bromoides* Dumort., var. *Bromus dertonensis* All., var. *Broteri* (Asch. & Graeb.). *F. hybrida* Brot. Fl. Lusit. i. 115. *Vulpia Broteri* Boiss. & Reut. Pugill. Pl. Nov. 128, 1852. *Festuca Broteri* Nyman. *Vulpia Myurus*, var. *tenellus* Boiss. Voy. Esp. ii. 668, 1845. *Vulpia sciuroides* Gmel., var. *microstachya* Hackel. Fig. 75.

Spain, Portugal, Sardinia.

This differs from typical *bromoides* in the thicker and slightly longer panicle, in the spikelets being about 6 mm. long without the awns, and in the awns being 2-3 times as long. *F. bromoides* has a much shorter and stiffer panicle than *F. Myurus*, the uppermost internode being longly exserted and the panicle $2\frac{1}{2}$ - $7\frac{1}{2}$ cm. long.

First found in Britain, I. M. H., August 1910. See *Rep. B.E.C.* 511, (1910) 1911. Banks of the Gala below Galashiels, Selk., and on an embankment by the Tweed $1\frac{1}{2}$ miles onward, Roxb. Abundant. Flowering July to September. Det. Prof. Hackel.

The type, *F. bromoides*, is also plentiful. See *Tr. Bot. Soc. Edin.* 44, 1909.

2792 *F. Myuros* L.

Capon's Tail Grass.

F. Pseudo-Myurus Soy.-Will. *Vulpia Myurus* Gmel.

Syme E. B. xi. t. 1781.

Through Central and S. Europe, Central and W. Asia—ascending to nearly 4000 metres in W. Tibet, Beluchistan, Arabia, Persia,



Fig. 75.

FESTUCA BROMOIDES L., var. TENELLA (Boiss.).

Afghanistan, N. & S. Africa, Canaries, America—excluding the centre. Adventive in Australia and New Zealand.

Stem erect, 2-7 dm., slender, the uppermost internode usually wholly enclosed in the sheath; panicle 7-30 cm. long, tapering and curving, rather lax and more distichous than unilateral; glumes unequal, the lower two to three times shorter than the upper (sometimes reduced to a scale); awn longer than the pale; fruit glabrous. A very graceful and pretty species.

First record: Sides of the Gala, A. Brotherston in *Rep. Bot. Rec. Club* 79, 1874. Also near the mouth of the Gala, A. Brotherston in *Proc. Berw.* 273, 1874. Very plentiful by the Gala below Galashiels, Selk., August 1908, and by the Tweed near Melrose, Roxb., I. M. H. See *Tr. Bot. Soc. Edin.* 44, 1908. Flowering July to September.

691 BROMUS (Dill.) L.

A large, somewhat polymorphic and overloaded genus of about 40 species, found mostly in the temperate regions of the northern hemisphere. Others are found in South America, and some appear at high altitudes in the tropics. The name is said to be derived from the Greek word for food. They may afford food for the gods, but man obtains nothing from them and, with the exceptions of *Bromus unioloides* and *inermis*, they are not remarkably good pasture plants for animals. The species are known by the panicked spikelets of three to many flowers; the flowering glumes mucronate or awned, dorsally rounded, 5-9-nerved; the top of the ovary lobed and villous.

2794 B. rigens L.

B. maximus Desv. *B. villosus* Forsk. Syme E. B. xi. t. 1798.

Channel Isles, Portugal, Spain, France, Italy, Adriatic coast, Greece, S.W. and Central Asia, Egypt, Algeria, Morocco, Canaries, Madeira. Adventitious in Europe, Mauritius, South Africa—Cape Colony, Natal, etc.

A beautiful annual species from its large spikelets with very conspicuous awns, $3\frac{3}{4}$ -5 mm. long; stem stout, ascending from a curved or geniculate base, pubescent towards the top; panicle branches 2-6; spikelets erect or slightly drooping, at first linear-elliptical, after flowering oblong-cuneate, with parallel sides, from 4-12-flowered; glumes very acute, lanceolate-subulate, with broad scarious margins, less than half as long as the awn; lower glume 1, rarely 3-nerved, upper 3-5-nerved; inner glumes 5-7-nerved.

First found on Tweedside, I. M. H., August 1908. Banks of the Gala below Galashiels, Selk., and along the Tweed between Galashiels and Melrose, Roxb. Abundant. Flowering August to September. Det. A. Thellung.

2797 B. tectorum L.

Reichb. Ic. t. 73, f. 1582. Weed Flora of Iowa 51, f. 28.

Through Central and S. Europe, but adventive only in Britain, Denmark, and the north; widely spread in Asia except the south, India frequent, reaching in the W. Himalayas to 3500 metres; Beluchistan, Baltasan, Afghanistan, China, Egypt, N. Africa, Canaries. Adventive in North America—Rhode Island to Ontario, south to Maryland and Ohio; New Zealand.

A beautiful species from its very delicate panicle of soft, drooping, unilateral spikelets, sometimes 12 cm. long; awn 8-20 mm. long; glumes unequal, acuminate; stem pubescent towards the top; panicle branches curved, capillary, soft and flexuous.

First record: Tweedside, below Kelso, Roxb., A. Brotherston in *Rep. Bot. Rec. Club* 79, 1874, and *Proc. Berw.* 273, 1874. One or two plants, Galafoot, Selk., I. M. H., 1908. See *Tr. Bot. Soc. Edin.* 44, 1909.

2798 B. madritensis A. D. Juslenius in L. Amoen. Acad. iv. 265. Syme E. B. xi. t. 1797.

Britain, Portugal, Spain, France, Italy, Adriatic coast, Greece, Thrace, Belgium, Switzerland, S.-W. Russia to Persia, Taurus, Arabia, Egypt, N. Africa, Canaries. Adventive in New Zealand.

Annual or biennial; stem 1-6 dm. from a curved or geniculate base, feebly pubescent above, with an erect, rather small, nearly simple, dense or rather lax, somewhat variable, contracted panicle; spikelets large, 3-5 cm. long without the awns, purplish-brown or violet-brown when mature; awn erect; lower glume with 1 prominent rib, the upper 3-ribbed.

First found on Tweedside, I. M. H., July 1909. See *Tr. Bot. Soc. Edin.* 43, 1909. Banks of the Gala from the township of Galashiels to its junction with the Tweed, Selk. Abundant. Flowering July to September. Named at Kew by W. B. Turrill and by A. Thellung.

Misspelled by Linnaeus. Being named after Madrid it should be *matritensis*.

2799 B. rubens A. D. Juslenius, *l.c.*
Festuca rubens Pers. *Flora Graeca* t. 85.

A Mediterranean species found in Iberia, S. France, S. Italy, Greece, Taurus, Arabia, Palestine, Egypt, Tunis, Morocco, Algeria, Canaries.

A beautiful species allied to *madritensis*, but with the stem usually densely pubescent; panicle compact, ovoid or obovate, very shortly branched; spikelets smaller, slightly flattened, 4-8-flowered; lower inner glume feebly 3-nerved; awn curved outwards, about as long as the glume. The panicle, greenish at first, eventually becomes reddish-violet.

First found on Tweedside, I. M. H., October 1911. Banks of the Gala within the burgh of Galashiels and near its junction with

the Tweed, Selk., also by the side of the Tweed between Galashiels and Melrose, Roxb. Abundant. Flowering August to September. Det. A. Thellung.

2801 B. erectus Huds. Fl. Ang. 49, 1762.

Schoenodorus erectus Fries. Syme E. B. xi. t. 1796.

Throughout Europe except the extreme north (? Greece and Turkey), W. Asia, Syria, N. Africa, (not in Egypt). Adventive in New Zealand.

A common grass on calcareous soils in England, known by its dimorphic leaves, the lower narrow, the stem leaves twice as broad; panicle upright, of large spikelets, with bright orange anthers.

Recorded by A. Brotherston from Roxburgh in *Rep. Bot. Rec. Club* 50, 1874. Frequently found by the Tweed as a wool introduction.

2803 B. unioides H. B. K. Nov. Gen. 151, 1815.

B. Schraderi Kunth Enum. i. 416, 1833. *Ceratochloa unioides* Beauv. and DC.

Britton & Brown Ill. Fl. North. U.S., etc., i. 224.

Texas to Arizona, Mexico, Peru, Chile, Brazil, W. Africa, Natal, Australia, New Zealand, there called Prairie Grass. Adventive in France in 1825 and extensively introduced as a fodder grass into Europe and elsewhere.

Easily recognisable by the large and very flat, glabrous spikelets; stems 1.5 to 10 dm., erect, simple, smooth, glabrous; sheath shorter than internode; panicle 5-25 cm. long, branching, erect; spikelets much compressed, 6-10-flowered; empty glume acute; flowering glume very acute; awn usually very short or absent.

First record: *Ceratochloa unioides* DC., Tweedside, between Kelso, Roxb., and near the mouth of the Gala, Selk., A. Brotherston in *Proc. Berw.* 273, 1874. Banks of the Ettrick near Selkirk, by the Gala below Galashiels, Selk., and by the Tweed between Galashiels and Melrose, Roxb., I. M. H. Abundant. See *Tr. Bot. Soc. Edin.* 44, 1909. Flowering July to October. Still of frequent occurrence.

The forma *aristatus* was also found by I. M. H. at Galafoot in 1915.

2806 B. secalinus L.

Serrafalcus secalinus Bab. Syme E. B. xi. t. 1800.

As a cornfield weed throughout Europe except the extreme north. Nyman does not record it for Greece or Turkey. In the Caucasus, Siberia, Japan, throughout temperate North America and N. Africa. Adventive in North America, where it is a pernicious weed, and called "Cheat" or "Chess."

This and the following annual species belong to the section or sub-genus *Serrafalcus*, in which the spikelets are not enlarged towards the

top during flowering, but are broadest below the middle; the awn is usually shorter than the pale, which is rounded dorsally, concave, elliptic or oval; the lower glume 3-5-, rarely 1-nerved, the apex 5-9-nerved; inner glume 7-9-nerved. In this species, which is common in British cornfields, the spikelets, although imbricated in flower, are separated in fruit from the margins of the lower pale becoming involute.

First found on Tweedside from Edenmouth to Gala, Selk. and Roxb., A. Brotherston in *Proc. Berw.* 137, 1873. Here it exists under various modifications, sometimes as the var. *velutinus* (Schrad.) with very pubescent spikelets, or as the var. *submuticus* (Reichb.) in which the awn is nearly obsolete. These were noticed by Brotherston. These various forms still exist on Tweedside in both counties, and have been found since 1911 by I. M. H. Johnston (*N. H.* 1853) records it from cornfields in Berwickshire.

2807 *B. pratensis* Ehrh. Beitr. vi. 84.

B. commutatus Schrad. Fl. Germ. i. 354, 1806. *Serrafalcus commutatus* Bab. Syme E. B. xi. t. 1802.

Throughout Europe except the extreme north, N. Africa. Adventive in Cape Colony, Natal, New Zealand.

In this plant, which attains a height of from 2-10 dm., the panicle is drooping, the lower panicle branches have two or more oblong-lanceolate, acute, glabrous spikelets, 12-24 mm., of a dull green, sometimes tinged with reddish-brown, rather shining; the florets are close, and the pales do not become so involute as in *secalinus*, but are more so than in *hordeaceus*; top of the upper glume half way to the top of the fourth flower.

Frequent by the Tweed, but not necessarily in all cases due to the wool industry, as is the case also with the closely allied *B. racemosus* L. This chiefly differs in the reduced length of the panicle branches, so that the inflorescence is racemose. First record for Selk.: Rev. J. Farquharson in *Proc. Berw.* 87, 1876, and for Roxb., I. M. H., 1910. On woollen waste heaps at Selkirk and on the Gala banks, Selk., and on the Tweed below Gala-shiels, Roxb. Flowering August to October.

2809 *B. arvensis* L.

Serrafalcus arvensis Parl. Syme E. B. xi. t. 1806.

Adventive in Britain and over a great area of Europe, but probably native in some parts of the central and southern countries, extending into W. and Central Asia, but not recorded for India. Adventive in N. & S. Africa, North America, New Zealand.

A more slender and graceful species than *commutatus*, with which at one time it was confused by British botanists. The drooping spikelets (10-20 mm.), which are borne on longer, flexuous stalks, are 6-12-flowered, narrower, linear-oblong, usually glabrous, green but usually variegated with white and purple.

First record: Kelso, Roxb., A. Brotherston in *Rep. Bot. Rec. Club*, 1874. Also on Tweedside at Galashiels near the influx of the Gala, Selk., I. M. H., August 1915. Flowering July to September. Uncommon.

2811 *B. hordeaceus* L. *Soft Brome Grass, Soft Chess* (U.S.A.).
B. mollis L., 1762. *Serrafalcus mollis* Parl. Syme E. B. xi. t. 1804.

Throughout Europe except the extreme north, Asia, (?adventive in India), Egypt, N. Africa, Canaries, Madeira, Azores. Adventive in North and South America, Australia, New Zealand, etc.

This is known from the foregoing species of the *Serrafalcus* section by the top of the upper glume being half-way to the top of the sixth flower. The spikelets are paniced and softly hairy.

The plant is very variable and exists under many modifications on Tweedside, evidence of its introduction from wool of various sources.

Var. *MOLLIFORMIS* (Lloyd) Druce in *Journ. Bot.* 188, 1902. *B. divaricatus* Lloyd, not of Rhode. *B. molliformis* Lloyd. *Serrafalcus Lloydianus* Gren. & Godr. *B. mollis*, var. *molliformis* Crépin. Syme E. B. xi. t. 1805.

England, France, Holland, Belgium, Portugal, Spain, Italy, Adriatic coast.

Differs from *hordeaceus* in the ovoid or elliptical, upright, compact panicle, contracted after flowering; the short branches; the narrower, softly hairy spikelets; the inner glumes very unequal; and in the more twisted and divaricate, somewhat longer awns.

First noticed at Galafoot, Selk., I. M. H., 1908. See *Tr. Bot. Soc. Edin.* 43, 1909.

The var. *LEPTOSTACHYS* Beck, which was found by I. M. H. in July 1912 on the Gala, is probably due to agricultural operations, as it is increasingly frequent in grass-seeds.

B. sterilis L., a common British grass, is of frequent occurrence on the Tweed. Fruits of it have been detected in Australian wool by I. M. H.

2813 *B. scoparius* A. D. Juslenius in L. Amoen. Acad. iv. 266, cent 1, n. 11, 1759.

Serrafalcus scoparius Parl.

Portugal, Spain, Italy, Adriatic coast, Greece, Thrace, Cyprus, Kashmir to nearly 2000 metres, Egypt, Tunis, Algeria.

Annual, 2-4 dm., ascending, glabrous; panicle erect, dense, 4 cm. long, 1-2.5 cm. broad, obtuse, with very short branches; spikelets densely 6-8-flowered, glabrous or slightly hairy; glumes somewhat unequal, rather acute, scarious-margined; flowering glume oblong, scarious-margined, about as long as its slender, spreading, twisted awn.

First found on Tweedside, J. Fraser and I. M. H., July 1909. Near the junction of the Gala and Tweed, Selk. Flowering July to September. Det. J. Fraser.

2815 *B. macrostachys* Desf. Fl. Atl. i. 96, t. 19, 1798.

B. lanceolatus Thore. *Serrafalcus macrostachys* Parl.

Portugal, Spain, S. France, Italy, Adriatic coast, Greece, Thrace, Siberia, Asia Minor, Persia, Syria, Mesopotamia, Turkestan, Afghanistan, Beluchistan, India, reaching at Spit in Tibet an altitude of nearly 4000 m., Egypt, N. Africa, Canaries.

Annual, tufted, stem 2-8 dm.; leaves and sheaths hairy; ligule short; panicle oblong or obovate-oblong, loose or contracted; spikelets green or purplish, $3\frac{3}{4}$ to $4\frac{1}{2}$ cm., elliptic to linear-oblong, imbricate, 9-17-flowered; flowering glumes all or the upper with two straight, slender, lateral awns, the median awn 1.25 to 2 cm., finally twisted and strongly divaricate.

First found at Galashiels, Selk., I. M. H., August 1908. See *Tr. Bot. Soc. Edin.* 43, 1909. By the banks of the Gala within the burgh of Galashiels, also near its mouth, Selk., and in some years plentifully along the Tweed between Galashiels and Melrose, Roxb. Frequently strong, large-headed plants. Flowering August to September. Det. A. Thellung.

2816 *B. squarrosus* L.

Corn Brome (U.S.A.).

Serrafalcus squarrosus Bab. Reichb. Ic. t. 75, f. 1598.

Spain, France, Switzerland, Italy, Adriatic coast, Serbia, Hungary, Transylvania, Rumania, Greece, S. Russia, Siberia, Turkestan, Asia Minor, Syria, N. Africa, China. Frequently adventive elsewhere in Europe and in North America.

Annual, stem 2-6 dm., ascending or erect; leaves linear, soft; sheath pubescent; panicle drooping, unilateral, lax; spikelets eventually pendulous, 2-4 cm. long, ellipsoid-lanceolate, shining; glumes unequal, the lower 5-nerved, the upper obtuse, 7-nerved; inner glumes unequal, the lower oval-lozenge-shaped with well marked angles, obtuse, feebly 9-nerved; awn twisted and strongly divergent, about as long as the glume; anthers very short.

First found at the mouth of the Gala, Selk., A. Brotherston. See *Proc. Berw.* 137, 1873.

2817 *B. japonicus* Thunb. Fl. Jap. 51, t. 11.

B. patulus Mert. & Koch. *Serrafalcus patulus* Parl. Reichb. Ic. t. 74, f. 1588.

In cultivated ground, rocky places, etc., in Scania, Germany, France, Switzerland, N. & M. Italy, Adriatic coast, Austria, Hungary, Transylvania, Serbia, Rumania, Russia but often adventitious, Syria, Persia, Kurdistan, Bhotan, W. Himalayas to

4500 metres, W. & Central Asia. Adventive in China, Japan, New Zealand, South Africa—coast, central, and west regions ; St. Helena ; Egypt as a var.

Stem 3-6 dm., erect or ascending ; leaves flaccid, hairy or glabrous ; ligule short ; panicle linear-oblong, usually nodding, often secund, branches long, slender, semi-verticillate ; spikelets often violet, rarely greenish, oblong, 7-14-flowered, eventually lax ; glumes pointed, very unequal, lower narrow-lanceolate, 3-5-nerved ; awns nearly equal, eventually twisted and very divergent.

First record : *B. patulus*, Tweedside, Kelso, A. Brotherston in *Proc. Berw.* 137, 1873. Galashiels, Selk., I. M. H., 1908. See *Tr. Bot. Soc. Edin.* 43, 1909. By the banks of the Gala, Selk., and of the Tweed, Roxb. Flowering July to September.

2817 (3) *B. marginatus* Nees ex Steudel Syn. Gl. i. 322, 1855.

B. ciliatus L., ? not of Lam.

North America—River Columbia, St. Louis, California, Oregon.

Leaves and sheaths hairy ; panicle erect, strict ; branches sub-simple ; spikelets oblong-lanceolate, compressed, convex, pubescent-scabrid, 6-8-flowered ; inner glumes 7-nerved, awned.

First record : Galashiels, Selk., I. M. H., September 1911. See *Rep. B.E.C.* 345, (1913) 1914. Embankment by the Tweed between Galashiels and Melrose, Roxb. Flowering August to September. Det. Prof. Hackel.

2817 (4) *B. arenarius* La Bill. Pl. Nov. Holl. i. 23, t. 28, 1806.

B. japonicus, var. *velutinus* (teste Hackel) *Rep. B.E.C.* 345, (1913) 1914. *B. adoensis* (det. A. Thell.) in *Rep. B.E.C.* iv. t. iv. 30, (1914) 1915, not of Hochst. *B. australis* R. Br. Fig. 76.

Australia : New South Wales, Victoria, South Australia, W. Australia—where nearly glabrous specimens are found.

Plant stout, 3-5 dm., ; leaves flaccid, flat, softly hairy or pubescent ; panicle at first erect, then drooping ; capillary branches clustered, the longer ones 5-7 cm. long with 1-4 spikelets on capillary pedicels ; spikelets lanceolate, 1.25-2 cm. long without the awns, flat, 5-9-flowered ; glumes pubescent or glabrous, the lowest about 3 lines long, 5-nerved, the second longer and 7-nerved, both empty and acute, convex on the back ; awn free from a little below the scarious tip, 1.25 to 2 cm. long.

First found in Britain at Selkirk, I. M. H., August 1912. On woollen waste heaps at Selkirk, Selk. Flowering August. Very rare. Named by Prof. Hackel as *B. japonicus*, var. *velutinus*. See *Rep. B.E.C.* 345, (1913) 1914, but subsequently corrected by Dr Thellung to the above.

General Munro thought *B. arenarius* might be the same as *B. japonicus*, which was Prof. Hackel's first suggestion.



Fig. 76.

BROMUS ARENARIUS La Bill.

692 BRACHYPODIUM Beauv. Agrost. 100, 1812.

A small genus, of which about 16 species have been described, not easy to discriminate, mainly found in the temperate regions of the northern hemisphere. The species are mostly perennial; spikelets sub-sessile (hence the name from *brachys*, short, and *pous*, a foot); rachilla elongated and jointed below the flowering glume; glumes imbricate, shorter than the florets, unequal, mucronate, strongly ribbed; pales 2, concave, entire, mucronate or awned; top of the fruit villous.

2820 B. distachyum Beauv. Agrost. 101, 1812.

Bromus distachyus L. Amoen. Acad. iv. 304. *Trachynia distachya* Link. Reichb. Ic. t. 14, f. 1368.

Portugal, Spain, France, Italy, Adriatic coast, Greece, Thrace, Taurus, W. Asia, Syria, Asia Minor, Arabia, Persia, Afghanistan, Egypt, N. Africa, Abyssinia, Madeira, Canaries. Adventive in Germany, Hungary, Switzerland, etc.

Annual, stem 1-4 dm., upright or spreading, glabrous; nodes pubescent; leaves pale whitish-green, linear, acuminate, short, flat, more or less softly hairy, ciliate; sheaths usually glabrous; ligule 1 mm. long, truncate; spike upright, of 1-5 (usually 2-3) lanceolate spikelets, contiguous, 6-25-flowered; glumes long, acuminate, often mucronate; flowering glumes firm, obtuse; awn nearly twice as long (8-18 mm.).

First found at Galashiels, Selk., J. Fraser, August 1908. See *Tr. Bot. Soc. Edin.* 44, 1909. Since found plentifully by the banks of the Gala between Galashiels and its junction with the Tweed, Selk., I. M. H. Flowering August to October.

693 LOLIUM L.

A small genus, of which about 20 species, very difficult to discriminate, have been described, natives of the northern hemisphere of the Old World, but now very widely spread with cultivation, one or two of them being of the highest importance as pasturage or fodder grasses. They are distinguished by the compressed spikelets arranged in two ranks in the hollows of the rachis of a simple terminal spike with their side towards the rachis. *Lolua* is said to be the Celtic name for this grass. *Lolium* was used by Pliny.

2821 L. temulentum L.

Darnel.

Syme E. B. xi. t. 1816.

A weed of cultivated ground in Europe, W. and Central Asia, Punjab, Scinde, Beluchistan, Kurdistan, Afghanistan, N. Africa, Egypt, Natal, Canaries. Adventive in North America from New Brunswick to Michigan and Georgia, and abundant on the Pacific coast. Abundantly native in New South Wales, Victoria, South Australia, Tasmania, New Zealand.

Annual, stems fasciculate, 2-12 dm., stiff, straight, glabrous, rough ; spike erect, 5-30 cm. long, of about 10-20 wedge-shaped, obtuse or truncate, 5-9-flowered spikelets ; flowers turgid ; glume somewhat longer, sub-obtuse to acute, very rigid, glabrous, 7-9-nerved ; awn sub-terminal, straight, up to 18 mm. long.

First record : Many plants in the bed of the Gala, Selk., and as the var. *longiaristatum*, A. Brotherston in *Proc. Berw.* 137, 1873. Galashiels, Selk., I. M. H., 1910, and in succeeding years. Det. G. C. Druce.

Var. *arvense* (With.) = var. *macrochaeton* A. Braun, is similar to the foregoing, but the awn is obsolete.

Johnston (*Flora* 30, 1829) records the type and variety as very rare in cornfields.

The Italian Rye Grass, *Lolium Boucheanum* Kunth Rev. Gram. ii. 220, 1829, et Enum. 436, 1833 = *L. italicum* A. Braun in *Flora* xvi. 259, 1834, is of very frequent occurrence on Tweedside, but it is an agricultural rather than a wool introduction. See I. M. H. in *Tr. Bot. Soc. Edin.* 44, 1909.

2823 *L. multiflorum* Lam. Fl. Fr. iii. 621, 1778.

Throughout Central and S. Europe, W. Asia, N. Africa, Egypt, Natal, but the plant records are confused with other species.

It is closely allied to *L. Boucheanum* (*italicum*), but is annual, not perennial, has no tufts of barren leaves, and the spikelets have a larger number of flowers, i.e. 15-25 as against 12-15.

Found by I. M. H. not infrequently and under several modifications on the banks of the Gala and Tweed, Selk. and Roxb., 1907, but the actual origin is a little uncertain. Det. A. Thellung.

L. perenne L., the Perennial Rye Grass of seedsmen, occurs in considerable quantity under several modifications on Tweedside, such as *compressum* Sibth., *compositum* Sm. and *cristatum* Doell, (forma *cristatum* Timm), but these also may be due to native plants being washed down to the shingle.

2826 *L. rigidum* Gaudin Agrost. i. 334, 1811.

Portugal, Spain, France, Italy, Switzerland, Adriatic coast, Greece, Taurus, S. and W. Asia, Syria, Palestine, Persia, Japan, Egypt, N. Africa, Canaries, Madeira.

Annual, tufted, ascending, erect or geniculate, 2-5 dm., without tufts of barren leaves ; spike stiff, often incurved ; spikelets broad, short, 3-7-flowered ; glume obtuse, appressed to rachis, a little shorter than spikelets ; upper pale shortly ciliate, mucous.

First found in Selk., I. M. H., October 1911. Plentifully by the banks of the Gala within the burgh of Galashiels and also onward to its outfall into the Tweed, Selk. Flowering September to October. Named at Kew.

697 **LEPTURUS** R. Br. Prod. 207, 1810.

A small genus of about 6 species, natives of the Old World, so named from *leptos*, slender, and *ouros*, a tail, in allusion to their slender, curved or straight, articulate, distichous or unilateral spikes on which the spikelets are placed in notches in the rachis which has been excavated to hold them, and in which they are completely sunk when closed or open during flowering, each containing one perfect floret.

2845 **L. filiformis** Trin. Fund. Agrost. 123, 1820.

L. incurvatus, sub sp. *vulgatus*, var. *gracilis* Rouy Fl. Fr. xiv. 339. Syme E. B. xi. t. 1818.

A littoral plant, native of Britain, Denmark, S. Sweden, Germany, Holland, Belgium, Portugal, Spain, France, Italy, Greece, Cyprus, Armenia, N. Africa.

Flowering stems erect or decumbent, much branched; ligule very short, truncate; spikes slender, straight or slightly curved; pales as long as the glume

Found near the Skin-works at Galashiels, Selk., September 1914, and by the Tweed, Roxb., I. M. H. Flowering August to September.

2846 **L. incurvus** (L.) Druce in Rep. B.E.C. 8, 1903.

L. incurvatus Trin., l.c. *Aegilops incurva* L. *Agrostis incurvata* Scop. *Rotboellia incurvata* L. f.

Portugal, Spain, France, Italy, Adriatic coast, Greece, Macedonia, Asia Minor, Syria, Persia, Beluchistan—Quetta, where it is used for fodder; Egypt, Algeria, Madeira, Australia; New South Wales—salt marshes, Paramatta; Victoria—Port Phillip; New Zealand. Adventive on ballast in England, Belgium and Germany.

Plant stouter, procumbent, densely branched; spikes very curved, thick, often reddish; glumes long; anthers very short.

First record: One tuft on Tweedside above Melrose, Roxb., J. Fraser, 1908. See *Tr. Bot. Soc. Edin.* 44, 1909. Since found plentifully there by I. M. H. in subsequent years both in Selk. and Roxb. Flowering July to September.

699 **HORDEUM** (Tourn.) L.

A genus of about 20 species found mainly in the temperate regions of the northern hemisphere. A few of them are very important cereals, largely cultivated over extensive areas. From the bristly awns of some species they have been unintentionally introduced by man into many countries, and one or two have been detrimental to sheep from the manner in which the awns penetrate the skin of the animal and travel into the inner economy, causing suffering and even death. It is also detrimental to the skin or fleece. The plants are annual or

perennial with hyaline ligules ; spikes cylindric, dense, usually very bristly and often very fragile ; spikelets 1 flowered ; rachilla jointed at the base of the flowering glume and produced above it ; empty glumes subulate or bristle-like or narrowly linear, awned, rigid, 1-3-nerved ; flowering glumes lanceolate, sub-involute, 5-nerved, gradually produced into a bristle-like awn.

2849 *H. murinum* L.

Wall Barley.

Syme E. B. xi. t. 1822. Fig. 77.

By roads and dry waste ground throughout Europe except the north, through Asia to Persia, Beluchistan, Kashmir ; N. Africa, Madeira, Canaries. Adventive in North America, Australasia, New Zealand.

Annual or biennial ; stems numerous, $1\frac{1}{2}$ to 8 dm., usually geniculate, weak ; leaves rather flaccid, 6-12 mm. broad and 5-15 mm. long ; spikes erect or slightly bent, somewhat tetragonal, much compressed, broadly oblong-linear, glaucous green, 5-10 cm. long, flowering in long succession ; empty glumes of the central spikelet lanceolate and ciliate at base, attenuated into awns of about twice their own length ; inner glume of the lateral spikelet linear, subulate, gradually narrowed into an awn three times its length, scabrous and ciliated ; outer glumes setaceous and awn-like throughout.

Only adventive in Scotland. The frequent occurrence on Tweedside points to its being a wool introduction. First record : Wastes, roadsides in Berw. J. V. Thomson (*Flora* 15, 1807). Sprouston, Roxb., A. Brotherston in *Proc. Berw.* 286, 1876. Galashiels, Selk., G. C. Druce in *Ann. Scot. Nat. Hist.* 174, 1911. Found by I. M. H. at the junction of the Gala, Selk., and Tweed, also by the latter stream between Galashiels and Melrose, Roxb. Abundant. The fruits have very long awns which work their way into the fleece both when the flock is feeding and lying down and are practically irremovable. Any attempt in that direction on the part of the sheep only aggravates the trouble. The awns penetrate even the skin of the animals and cause them much torture. The eradication of this grass, or the cutting down before seed time, would be an act of mercy. The seeds are mostly found in Port Phillip wool, and I. M. H. has grown plants from seeds taken from it. Flowering June to September.

2850 *H. maritimum* Huds. Fl. Ang.

H. maritimum With. Syme E. B. xi. t. 1823.

On the European coasts from the Baltic to the Ionian Sea and all round the Mediterranean. It also extends in S. W. Asia as far as Persia ascending in the hills to 1500 metres, Egypt, N. Africa, Canaries. Adventive in America and New Zealand.

A very gregarious species, with stiff erect stems from a longly geniculate base ; nodes glabrous ; leaves rather firm, narrowly



Fig. 77.

Skin pierced by the fruits of *HORDEUM MURINUM* L.

linear, tapering from base to apex, pale glaucous green; spike erect, oblong-linear or oblong, cylindric-tetragonal, slightly compressed, glaucous green; empty glumes of all the spikelets slightly dilated at base, not ciliate, one of each lateral spikelet broader than the rest; awns of the lateral spikelets shorter than the glumes of the central spikelet.

A smaller stiffer species than *H. murinum* and doubtless a wool-alien on Tweedside where I. M. H. found it, September 1908, at Galashiels Skin-works, Selk., and also along the banks of the Gala and the Tweed, Roxb. See *Tr. Bot. Soc. Edin.* 44, 1909. Although this is a comparatively common British seaside grass its abundance and luxuriance near Galashiels point to the probability of its being a wool-alien in that district. Flowering July to September.

2851 *H. jubatum* L.

{ *Squirrel-tail Grass* (U.S.A.),
{ *Skunk-tail Grass* (Canada).

Weed Flora of Iowa 59, f. 31, 32. Britton & Brown Ill. Fl. North. U.S., etc., i. 229, f. 531.

In dry soil, America—Ontario to Alaska, south to Kansas, Colorado and California, east United States; South America; Siberia. Adventive in France since 1859, Germany, Switzerland, etc.

A very beautiful annual or biennial species from its long awns which eventually become a dark crimson-red; stems $2\frac{1}{2}$ -10 dm., erect, simple, glabrous; spike 5-10 cm.; spikelets usually in threes; awn of the flowering glumes 25-30 mm. The florets are smaller than those of *marinum* for which in the early stage it might be mistaken. It is a prolific seeder. A single plant may produce up to 2000 mature seeds.

First record for Tweedside: I. M. H., July 1915. Found near the junction of the Gala and Tweed. Flowering July to August. Det. G. C. Druce.

This grass is a serious enemy to western Canadian stockholders, being a source of much injury to horses, cattle and sheep. The barbed seeds and awns penetrate the soft tissues of the mouth, causing irritation and inflamed ulcers; they work down beside the teeth, producing inflammation and swelling; and they are also said to work into the wool about the eyes of the sheep then into the tissues surrounding the eye and even into the ball itself, in many instances causing total blindness. *Tares and Weeds of Canada*, 30, Government Bureau, Ottawa, 1909.

2851 (2) *H. violaceum* Boiss. & Hohen. Diagn. ser. i. xiii. 70, 1853.

Boiss. Fl. Orient. v. 688, 1844. *H. nodosum* Bieb., not of L. Fig. 78.

Asia Minor, Armenia, Caucasus, Persia, Daghestan up to 2800 metres. Perennial, caespitose, the base thickened; leaves linear, flat, short; spikes cylindric, slender, dense, scarcely compressed, blackish-



Fig. 78.

HORDEUM VIOLACEUM Boiss. & Hohen.

violet ; rachis brittle, all the glumes setaceous, scabrid ; awn only about 6 mm. long ; lateral pale mucronate. A very beautiful species.

First found in Scotland, I. M. H., July 1912. See *Rep. B.E.C.* 345, (1913) 1914. On a woollen waste heap at Selkirk. In summer the heads show a beautiful shade of blue which loses much of its lustre as the season advances. Flowering July to September. Still there in 1917.

2854 (3) *H. muticum* Presl Rel. Haenk. i. 5, 327, 1830, var. ***andicola*** (Griseb.) Thell. Fl. Adv Montp. 157, 1912.

H. andicola Griseb. Symb. Fl. Argent. in Goett. Abh. xxiv. 285, 1879.

Argentina—in the region of the Andes ; Bolivia, Peru—Lake Titicaca. Differs from the type by the equal setaceous glumes, the spike 5 mm. broad.

First added to the British list, I. M. H., October 1915. See *Rep. B.E.C.* 218, (1915) 1916. Found on a woollen waste heap at Selkirk. Flowering August to October. Det. A. Thellung.

PTERIDOPHYTA.

Of this large class of Cryptogamous plants the Ferns alone number, according to Christensen (*Suppl. Index Filicum*) in 1912, no less than 7411 species.

104 POLYPODIACEAE Br.

A large family, spread over the world, consisting of about 110 genera and over 3000 species. Few are of economic importance, but an oily-resinous fluid is extracted by maceration in ether from the rhizome of the Male Fern, which is an effective vermifuge. The family is distinguished by the leaf-blade being many cells thick, usually large and pinnate ; the sori on the lower surface ; the sporangia stalked ; the spores of one kind ; the annulus vertical and incomplete ; with transverse dehiscence.

708 PTERIS L.

A genus of over 100 species, generally distributed, characterised by the fronds being of one kind, with the sori linear and continuous. The species which follows is separated from the others by Christensen as a monotypic genus under the name *Pteridium* Kuhn of 1879. The older name is, however, *Eupteris* Newman, which dates from 1845. Here it is treated as a sub-section of the genus *Pteris*, a name derived from *pteron*, from the wing-like fronds

2876 *Pteris aquilina* L., var. *esculenta* (Forst.).*Eupteris aquilina*, var. *esculenta*.

South Temperate Zone.

Differs from the British *Pteris aquilina* in the decurrent pinnules.

Branches of this fern, bearing spores, are occasionally found in New Zealand wool and may give rise to the fern in Britain. Wool containing the fronds is stained a reddish hue, which soap and alkaline scouring only intensify. Being difficult of removal, they materially impair its value. Named at the Edinburgh Botanic Gardens.

The rhizomes were formerly roasted and eaten by the Maories; hence the name.

ADDENDA.

247 (35) *Lepidium peregrinum* Thell., var. nov. *glabripes* Thellung, in litt.

Differt a typo pedicellis glaberrimis nec intus puberulis, racemis fructiferis elongatis haud distincte lateralibus, siliculis latioribus ($2:1\frac{3}{4}$ mm.), ovato-suborbiculatis, emarginature valde angusta, seminibus latioribus ($1\frac{1}{4}$: fere $\frac{3}{4}$ mm.). Planta evidenter magis normaliter evoluta quam specimen originale typi (qui = forma *umbrosa*?).

Galashiels, Selk., I. M. H., 1918.

356 (4) *Silene antirrhina* L.*Sleepy Catchfly.*

Britton & Brown Ill. Fl. North. U.S., etc., ii. t. 1449.

In waste places and woods, New England, southern Ontario and British Columbia, south to Florida and Mexico; South America. Ascends to 3200 feet in Virginia. Adventive in Germany, Holland, etc.

Annual, slender, erect or ascending, puberulent or glabrous, glutinous about the nodes, simple or branched above, 8 in. to $2\frac{1}{2}$ feet high, the branches ascending; basal and lower leaves spatulate or oblanceolate, 1-2 in. long, narrowed into a petiole, obtuse or acute, sometimes slightly ciliate, upper leaves linear and gradually reduced to subulate bracts; inflorescence a loose cymose panicle; pedicels slender, erect; flowers pink, opening for a short time in sunshine, about 1-2 lines broad; calyx narrowly ovoid, 2-3 lines long, much expanded by the ripening pod, its teeth ovate, acute; petals obcordate, minutely crowned. See Britton & Brown, *l.c.*

First found in Scotland on the shingle of the Gala, I. M. H., 1918. Det. A. Thellung. It was first found in England by A. R. Horwood at Wrentham, Suffolk. See *Rep. B.E.C.* 17, (1917) 1918.

Adventitious Plants of Tweedside other than Wool-Introductions.

It has been thought well to also include in this Flora the following plants which do not form part of the aboriginal flora of the Tweed drainage area, comprising the counties of Peebles, Selkirk, Roxburgh, Berwick, and Northumberland. They owe their origin to a variety of causes, many to agriculture or to its subsidiary branches, gardening and arboriculture and to the introduction of foreign corn to mills or for use as chicken food. A few come in with the railways, and others follow the operations of man in various ways. Some, such as the Currants and Gooseberry, are due to very ancient culture, while some, which were introduced for ornamental purposes, have now become quite naturalised. Many are quite fugitive.

- 1 CLEMATIS VITALBA L. On the ruins of Dryburgh Abbey, Roxb., G. C. D. and I. M. H. in *Ann. Scot. Nat. Hist.* 42, 1910.
- 16 ADONIS ANNUA L. Cultivated ground, Roxb., A. Brotherston in *Rep. Bot. Rec. Club*, 1875.
- 27 RANUNCULUS ARVENSIS L. Parton, Berw., A. Brotherston, 1876.
- 51 HELLEBORUS VIRIDIS L. Allanbank wood, Berw., Kelly in *Proc. Berw.* 125, 1876.
- 52 H. FOETIDUS L. Dryburgh Abbey, Roxb., also Berw., A. Brotherston, 1878.
- 53 CAMMARUM HYEMALE Greene (ERANTHIS). Banks of the Ellwyn near Melrose, Roxb., I. M. H., 1913.
- 54 AQUILEGIA VULGARIS L. Plentiful on the banks of the Tweed, Selk. and Roxb., I. M. H., 1909 ; see also *Proc. Berw.* 83, 1876.
- 68 ACONITUM NAPELLUS L. Banks of the Tweed, Selk., and Weirhill, Melrose, Roxb., I. M. H. in *Tr. Bot. Soc. Edin.* 40, 1909 ; near Ale Mill, Berw., Evans in *Proc. Berw.*, 1916.
- 69 ACTAEA SPICATA L. Monteviot grounds, Roxb., J. Fraser in *Scot. Bot. Rev.* 39, 1912.
- 72 BERBERIS VULGARIS L. Common about Tweedside, Selk., Roxb., and Peebles, G. C. D., 1880.

- 73 *B. AQUIFOLIUM* Pursh. River bank near Melrose, Roxb., I. M. H., 1910.
- 79 *PAPAVER SOMNIFERUM* L. By the Tweed near Kelso, Roxb., A. Brotherston, 1872, as var. *SETIGERUM*. See *Rep. Bot. Rec. Club* 139, 1875. Common on shingle of the Gala and on rubbish, Selk., I. M. H. in *Tr. Bot. Soc. Edin.* 40, 1909.
- 81 *P. DUBIUM* L. (*LAMOTTEI*). Common on Tweed shingle, Selk. and Roxb., I. M. H., since 1909.
- 85 *P. NUDICAULE* L. Plentiful near the junction of the Gala and Tweed, Selk., I. M. H. in *Tr. Bot. Soc. Edin.* 40, 1907.
- 92 *CHELIDONIUM MAJUS* L. Berw., Thompson, 1807; Jedburgh, Roxb., plentiful, Johnston *N. H.*, 1853; near Abbotsford Ferry, Selk., I. M. H., 1910.
- 92*b* *C. LACINIATUM* Mill. Stichill, Kelso, Roxb., I. M. H., 1907.
- 93 *ESCHSCHOLZIA DOUGLASHI* Walpers (*E. CALIFORNICA* Hort.). Near Kelso, Roxb., I. M. H., 1909.
- 100 *CAPNOIDES SOLIDA* Moench (*CORYDALIS*). Allanbank Abbey, Berw., A. Kelly in *Proc. Berw.* 125, 1876.
- 101 *C. LUTEA* Gaertn. Ednam, Roxb., A. Brotherston, 1875.
- 104 *FUMARIA PALLIDIFLORA* Jord. Gravel pit, Kelso, Roxb., A. Brotherston, 1875; Fairnilee, Selk., G. C. D., 1919.
- 121 *CHEIRANTHUS CHEIRI* L. Old wall, Berwick, Thompson, 1807; Kelso Abbey, Roxb., Johnston *N. H.*, 1853; on walls, Melrose Abbey, Roxb., G. C. D., 1905; Dryburgh Abbey, Roxb., I. M. H., 1915.
- 128 *BARBAREA VERNA* Asch. (*B. PRAECOX* R. Br.). Between Wooler and Earl, N., Johnston *Fl.* 146, 1829; railway embankment and Galafoot, near Galashiels, Selk., I. M. H. in *Tr. Bot. Soc. Edin.* 40, 1909.
- 131 *B. INTERMEDIA* Bor. Near Belses, Roxb., *Proc. Berw.*, 1880.
- 137 *ARABIS ALBIDA* Stev. A colony at Galafoot, Selk., I. M. H. in *Tr. Bot. Soc. Edin.* 40, 1909.
- 150 *LUNARIA ANNUA* L. On Ettrick pebbles near Lindean, Selk., I. M. H., 1910.
- 155 *ALYSSUM ALYSSOIDES* L. (*CALYCINUM*). Kelso, Roxb., A. Brotherston, 1875.
- 158 *A. MARITIMUM* Lam. Abundant by the side of the Tweed near Galashiels, Selk., I. M. H., 1911.
- 162 *DRABA MURALIS* L. Kelso, Roxb., A. Brotherston, 1874-1875; Selkirk, *Proc. Berw.* vii. 354.
- 166 *COCHLEARIA ARMORACIA* L. Tweed at Melrose, Roxb., G. C. D., 1905; Selk. and Peebles, G. C. D. in *Ann. Scot. Nat. Hist.* 42, 1910; by the Ettrick near Lindean, Selk., I. M. H., 1907.

- 176 *HESPERIS MATRONALIS* L. Reston Mill, Johnston *Fl.* 285, 1841; New Loudon, Berw., A. Brotherston, 1875; common by the banks of the Tweed near Galashiels, I. M. H. in *Tr. Bot. Soc. Edin.* 40, 1909.
- 177 *WILCKIA MARITIMA* Scop. (*MALCOMIA*). By the Ettrick near Lindean, Selk., I. M. H. in *Tr. Bot. Soc. Edin.* 40, 1909.
- 183 *SISYMBRIUM SOPHIA* L. Waste ground, East Ord, etc., N., Johnston *Fl.* 145, 1829. (See p. 5).
- 197 *ERYSIMUM CHEIRANTHOIDES* L. Roxburgh, A. Brotherston, 1875. (See p. 9).
- 206 *BRASSICA NAPUS* L. Cornfields, Berw., Johnston *Fl.* 147, 1829.
- 207 *B. RUTABAGA* DC. Berwick, Johnston *N. H.* 35, 1853.
- 208 *B. RAPA* L. Cultivated fields, Berw., Johnston *Fl.* 147, 1829.
- 217 *B. ALBA* Boiss. (*SINAPIS*). Cornfields, Berw., Johnston *Fl.* 147, 1829.
- 226 *DILOTAXIS TENUIFOLIA* DC. Seems to be naturalised in bed of rivers about Galashiels, Selk., and Melrose, Roxb., Stuart in *Proc. Berw.*, 1869.
- 241 *LEPIDIUM SATIVUM* L. Common by the banks of the Gala and Tweed, Selk. and Roxb., I. M. H. in *Tr. Bot. Soc. Edin.* 40, 1909.
- 244 *L. CAMPESTRE* Br. Shore at Berwick-on-Tweed, Thompson, 1807; Tweedside, Peebles, G. C. D. in *Ann. Scot. Nat. Hist.* 42, 1910; Cockburn Law, Selk.; Ellwyn, Roxb., Kelly and Shaw, 1902.
- 249 *THLASPI ARVENSE* L. Common along the Tweed, Selk. and Roxb., I. M. H. in *Tr. Bot. Soc. Edin.* 40, 1909.
- 252 *IBERIS AMARA* L. Selk., Rev. J. Farquharson in *Proc. Berw.* 83, 1876.
- 253 *I. UMBELLATA* L. Banks of Ettrick and Tweed, Selk., I. M. H., 1910.
- 285 *RESEDA LUTEOLA* L. Kingsmount, Berw., Thompson, 1807; Selk., Farquharson, *l.c.*, 1876; common at Galashiels, Selk., and on the Tweed, Roxb., I. M. H., 1910.
- 286 *R. ODORATA* L. By the banks of the Gala and Tweed, Selk. and Roxb., I. M. H.
- 303 *VIOLA TRICOLOR* L., var. *HORTENSIS*. By the banks of the Ettrick and Tweed, Selk., I. M. H., 1909.
- 320 *DIANTHUS BARBATUS* L. By the side of the Ettrick near Lindean, Selk., I. M. H., 1913.
- 329 *GYPHOPHILA MURALIS* L. Knowes, Kelso, Roxb., A. Brotherston, 1873.



Fig. 79.

GERANIUM ENDRESSII J. Gay.

- 343 *SILENE ANGLICA* L. Introduced into gardens, 1813, with seeds of *WHITLARIA GLOTINIODES* at Kelso, Roxb., A. Brotherston in *Proc. Berw.* 136.
- 363 *LYCHNIS GITHAGO* Scop. Cornfields, Berw., Johnston *N. H.* 41, 1853; Galafoot, Selk., I. M. H. in *Tr. Bot. Soc. Edin.* 40, 1909.
- 387 *ARENARIA BALEARICA* L. On old wall at Doddington on the Till, N., I. M. H., 1907.
- 419 *CLAYTONIA PERFOLIATA* Donn. Kelso, Roxb., Brotherston, 1875.
- 425 *HYPERICUM ANDROSAEMUM* L. Bergham Haugh, Berw., Johnston *Fl.* 292, 1841.
- 428 *H. CALYCINUM* L. South bank of the Tweed near Castleton Mill, planted by Mr Brydone, Johnston *N. H.*, 1853.
- 442 *ALTHAEA OFFICINALIS* L. Berwick and Northumberland.
- 444 *LAVATERA ARBOREA* L. Coldingham sands, Berw., Kelly & Shaw, 1902.
- 451 *MALVA MOSCHATA* L., var. *ALBA*. Fishwick Mains on Tweed, etc., Berw., Johnston *Fl.* 153, 1829; wayside, Clovenfords, Selk., G. C. D. & I. M. H. in *Ann. Scot. Nat. Hist.* 96, 1910. The type, considered alien by Rev. J. Farquharson, *l.c.*, 1876.
- 463 *TILIA PLATYPHYLLOS* Scop. (*GRANDIFOLIA*). Nenthorn Park, Berw., Johnston *Fl.* 292, 1841.
- 464 *T. EUROPAEA* L. Plantations, Berw., Johnston *Fl.* 292, 1841; by the Tweed near Dryburgh, Roxb., I. M. H.; at Traquair, Peebles, G. C. D., 1917.
- 468 *LINUM USITATISSIMUM* L. A stray plant in Berwickshire, Johnston *Fl.* 291, 1841; Innerleithen, Peebles, G. C. D.
- 469 *L. PERENNE* L. At Clovenfords and along the Tweed to Melrose, Selk. and Roxb., I. M. H. See *Tr. Bot. Soc. Edin.* 40, 1909. Probably of bird-seed origin.
- 474 *GERANIUM SANGUINEUM* L. Banks of Tweed at Melrose, Roxb., I. M. H., 1914.
- 475 *G. VERSICOLOR* L. (*STRIATUM*). Allanbank, Berw., Kelly, 1876; banks of the Eden, Stichill, Roxb., Johnston *Fl.* 285, 1841.
- 479 *G. PHAEUM* L. Watchlaw, Berw., A. Kelly, 1876.
- 479 (2) *G. ENDRESSI* J. Gay. On island at the junction of the Till and Tweed, Berw., I. M. H., 1915. Fig. 79.
- 481 *G. PYRENAICUM* Burn. f. Hoselaw, Roxb., *Proc. Berw.* 143, 1910.
- 501 *TROPAEOLUM MAJUS* L. At Galashiels, Selk., I. M. H., 1912.
- 503 *LIMNANTHES DOUGLASII* Br. On marshy margin of the Tweed near Galashiels, Selk., I. M. H., 1910.

- 505 *OXALIS CORNICULATA* L. Under a rose bush at Galashiels, Selk., I. M. H., 1913.
- 510 *IMPATIENS NOLI-TANGERE* L. Selk., Rev. J. Farquharson, *l.c.*, 1876.
- 513 *I. GLANDULIFERA* Royle. On island in the Tweed at junction with the Till, Berw., I. M. H., 1915.
- 517 *EVONYMUS EUROPAEUS* L. Cowdenknowes, etc., Berw., 1835 ; Trow's-Crags, Berw., Johnston *N. H.*, 1853 ; Stobs, Roxb., 1890 ; Denholm, Roxb., 1896 ; Galashiels, Selk., G. C. D. in *Ann. Scot. Nat. Hist.*, 1910.
- 520 *STAPHYLEA PINNATA* L. Near the Leader between Melrose and Earlston, Roxb., I. M. H., 1914.
- 523 *AESCULUS HIPPOCASTANUM* L. Planted Peebles, Selk., and Roxb., Johnston *N. H.*, 1853.
- 524 *ACER PSEUDOPLATANUS* L. Tweedside, G. C. D. in *Ann. Scot. Nat. Hist.*, 1905 ; common in all three counties, Peebles, Selk., and Roxb.
- 526 *A. CAMPESTRE* L. Hedge near Longridge, Johnston *Fl.* 291, 1841 ; planted near Traquair, Peebles, G. C. D., 1917.
- 532 *LABURNUM ALPINUM* Presl (*CYTISUS*). Hedge, Chirnside, Berw., Johnston *N. H.* 52, 1853.
- 564 *MEDICAGO SATIVA* L. Quarry, Sunnyside, etc., Berw., Johnston *Fl.* 165, 1829 ; on Whiteadder, Berw., Johnston *N. H.*, 1853 ; near the junction of the Gala and Tweed, Selk., I. M. H., 1908.
- 599 *TRIFOLIUM PRATENSE* L., var. *AMERICANUM* Harz. Peebles, G. C. D. in *Ann. Scot. Nat. Hist.* 96, 1910.
- 608 *T. INCARNATUM* L. Sometimes grown as a crop, Berw., Evans in *Proc. Berw.*, 1916.
- 627 *T. HYBRIDUM* L. Near the Gala below Galashiels, Selk., I. M. H., 1910 ; Dune, Berw., 1905 ; St Boswells, Roxb., G. C. D., 1910 ; Peebles, G. C. D., 1889 ; Berwick, Evans in *Proc. Berw.*, 1916.
- 648 *LOTUS TENUIS* Waldst. and Kit. Railway bank, Roxb., A. Brotherston, 1875.
- 675 *HEDYSARUM CORONARIUM* L. Near the Caddon, Clovenfords, Selk., I. M. H., 1910.
- 689 *VICIA FABA* L. Cultivated, Berw., Johnston *N. H.*, 1853.
- 697 *V. SATIVA* L. Cornfields, etc., Berw., Johnston *Fl.* 60, 1829 ; Peebles, G. C. D., 1889 ; Galashiels, Selk., in several forms ; Tweedside, Roxb., G. C. D.
- 731 *PISUM ARVENSE* L. Cultivated, Johnston *N. H.*, 1853 ; on the banks of the Gala and Tweed, Selk., I. M. H., 1910.
- 732 *P. SATIVUM* L. Galafoot, Selk., I. M. H. in *Tr. Bot. Soc. Edin.* 41, 1909.

- 737 *PRUNUS AVIUM* L. Dulaw-dene, Berw., Johnston *N. H.* 58, 1853 ; by the Tweed, Peebles, G. C. D., 1889 ; on Melrose Abbey walls, Roxb., G. C. D., 1905.
- 739 *P. DOMESTICA* L. (The Sour Plums of Galashiels). On the banks of the Till at Twizel Castle, N., Johnston *N. H.* 57, 1853.
- 744 *SPIRAEA SALICIFOLIA* L. Marchmont woods, Berw., Johnston *Fl.* 281, 1841.
- 885 *FRAGARIA MOSCHATA* Duchesne. Banks of the Gala below Galashiels, Selk., I. M. H., 1910.
- 915 *AGRIMONIA AGRIMONOIDES* L. Near Duns, Berw., G. C. D. and J. Ferguson in *Ann. Scot. Nat. Hist.*, 1907.
- 923 *ROSA ARVENSIS* Huds. Near Ashiestiel, Selk., G. C. D. in *Ann. Scot. Nat. Hist.* 167, 1911.
- 958 *PYRUS PINNATIFIDA* Ehrh. Planted at The Glen, Peebles, G. C. D., 1917.
- 959 *P. INTERMEDIA* Ehrh. Planted at The Glen, Peebles, G. C. D., 1917 ; at Selkirk, G. C. D. and I. M. H., 1917.
- 961 *P. ARIA* Ehrh. Plantation, Berw., Johnston *N. H.*, 1853 ; near Ashiestiel, Selk., G. C. D., *l.c.*
- 966 *CRATAEGUS MONOGYNA* Jacquin, var. *AUREA* Hort. Banks of the Tweed, Boldside, Selk., I. M. H., 1912. Flowers white, tinged with pink ; berries varying from lemon to crimson. Rare.
- 972 *COTONEASTER MICROPHYLLA* Wallich. On site of Roman Camp, Rinkhill, Galashiels, Selk., I. M. H., 1910 ; seedling at Abbotsford, Roxb., G. C. D.
- 972 (2) *C. SIMONSII* Baker. Found beside *C. microphylla* ; both possibly planted.
- 989 *SAXIFRAGA UMBROSA* L. Bank of Tweed at Holmeliffe, Berw., Johnston, 1829 ; Den of Edrington House, Berw., Johnston *N. H.*, 1853 ; at Broughton, Peebles, G. C. D., 1889.
- 1001 *RIBES UVA-CRISPA* L., var. *GROSSULARIA* (L.). Lyne, Peebles, G. C. D., 1889 ; at Melrose, Roxb., and Duns, Berw., G. C. D., 1905 ; abundant in some hedgerows between Galashiels and Selkirk, I. M. H., 1910.
- 1002 *R. NIGRUM* L. Sites of old cottages, Berw., Johnston *Fl.* 291, 1841 ; Galashiels, Selk., and Tweedside, Peebles, G. C. D. in *Ann. Scot. Nat. Hist.* 97, 1910 ; on island in Tweed and other places near Dryburgh, Roxb., I. M. H., 1910.
- 1003 *R. RUBRUM* L. Sites of deserted cottages, Berw., Johnston *Fl.* 291, 1841 ; by the Ettrick and Tweed, Selk., I. M. H., 1910. The gooseberry and currants look quite wild by the Tweed.

- 1004 *R. ALPINUM* L. At Roxburgh and Bemersyde, Berw., A. Brotherston, 1874; in a hedge near Dryburgh, Roxb., G. C. D. in *Ann. Scot. Nat. Hist.* 97, 1910.
- 1004 (2) *R. SANGUINEUM* Pursh. On the banks of the Gala below Galashiels, Selk., I. M. H., 1911.
- 1012 *SEDUM REFLEXUM* L. On old wall near the Gala below Galashiels, Selk., I. M. H., 1913.
- 1016 *S. ALBUM* L. Dyke top, Lauder, Berw., Kelly and Shaw, 1902; see *Ann. Scot. Nat. Hist.* 97, 1910; on railway embankment, Thornilee, Peebles, and by the Tweed between Galashiels, Selk., and Melrose, Roxb., I. M. H., 1909. Common.
- 1017 (2) *S. LYDIUM* Boissier Diagn. ser. iii. 17. A native of Lydia and Mount Cadmo. Found by G. C. D. and I. M. H. at the base of a wall at Clovenfords, Selk., well established. See *Rep. B.E.C.* 502, (1910) 1911; see also G. C. D. in *Ann. Scot. Nat. Hist.* 168, 1911. Still plentiful and spreading very rapidly over the gravel path in I. M. H.'s garden at Galashiels, to which it was accidentally introduced. G. C. D. noticed some plants in the gardens of The Glen and Orchardmains, Peebles (1917). A beautiful species, with foliage bright green and changing to red. The above is the first British record.
- 1026 *SEMPERVIVUM TECTORUM* L. Near Berwick-on-Tweed, Thompson, 1807.
- 1046 *EPILOBIUM AUGUSTIFOLIUM* L. Plentiful on the banks and shingle of the Tweed in Selk. and Roxb. See Farquharson, *l.c.*, 1876, and Johnston *Fl.* 86, 1829.
- 1053 *E. LANCEOLATUM* Seb. and Maur. Garden ground, Galashiels, I. M. H., 1910.
- 1058 (2) *E. ALSINOIDES* A. Cunn. Abundant throughout New Zealand up to 800 metres. Found by J. Roseburgh at Tweedside, Selk. See *Tr. Bot. Soc. Edin.* and *Rep. B.E.C.* 14, (1914) 1915. Named at Kew.
- 1061 *OENOTHERA BIENNIS* L. By the banks of the Tweed between Galashiels and Melrose, Roxb., I. M. H., 1912.
- 1061 (2) *OE. AMOENA* Lam. At the junction of the Gala and Tweed, Selk., I. M. H., 1913.
- 1090 *BUPLEURUM ROTUNDIFOLIUM* L. The Knowes, Kelso, Roxb., A. Brotherston, 1875.
- 1097 *APIUM GRAVEOLENS* L. Under hedges, Berw., Johnston, 1829; near Galashiels, Selk., I. M. H., 1909.
- 1105 *CARUM PETROSELINUM* B. & H. (*PETROSELINUM SATIVUM*). Berwick, Johnston *N. H.*, 1853.
- 1112 *AEGOPODIUM PODAGRARIA* L. Selk., Farquharson, *l.c.*, 1876; at Duns, Berw., G. C. D., 1905; Traquair, Peebles, G. C. D., 1917; by the Tweed, Faldonside, Selk., I. M. H., 1912.

- 1113 *PIMPINELLA MAJOR* Huds. (*P. MAGNA*). One plant, Kelso, Roxb., A. Brotherston, 1874.
- 1116 *MYRRHIS ODORATA* Scop. Pinnaclehill, Kelso, Roxb., Thompson, 1807 ; Coldingham, Berw., Johnston *Fl.* 291, 1841.
- 1148 *ARCHANGELICA OFFICINALIS* Hoffm. Said to have been found not far from Berwick, See Merrett *Pinax*, 1666.
- 1152 *PEUCEDANUM OSTRUTHIUM* Koch. At Yetholm, Roxb., 1871 ; at Dryburgh, Roxb., A. Brotherston in *Proc. Berw.* 196, 1872 ; by the Ettrick, Selk., I. M. H. in *Tr. Bot. Soc. Edin.* 41, 1909.
- 1173 *CORNUS SANGUINEA* L. Shrubberies, Berw., Johnston *Fl.*, 1843 ; by the Yarrow above Selkirk, I. M. H. See *Ann. Scot. Nat. Hist.* 169, 1911.
- 1175 *C. STOLONIFERA* Michx. Semi-wild in various places in Peebles, Selk., and Roxb., I. M. H. See G. C. D. in *Ann. Scot. Nat. Hist.* 169, 1911.
- 1177 *SAMBUCUS RACEMOSA* L. The Swiss elder. Growing in great abundance and seeding freely on hillsides at Elibank, Peebles. Its profusion of scarlet berries in early autumn is very beautiful. Birds are fond of these berries and assist in their distribution. I. M. H., 1910.
- 1178 *S. LACINIATA* L. In Torwoodlee Woods, two miles above Galashiels, Selk., I. M. H., 1914.
- 1179 *S. EBULUS* L. Chatton by the Till, N., Thompson, 1807 ; Coldingham, etc., Berw., Johnston *Fl.* 276, 1831 ; Linton churchyard, Berw., Johnston *Fl.* 96, 1853.
- 1182 *SYMPHORICARPOS RACEMOSUS* Michx. At Peebles, G. C. D. in *Ann. Scot. Nat. Hist.* 98, 1910 ; in hedgerow near Dryburgh, Roxb., I. M. H., 1909.
- 1208 *ASPERULA TAURINA* L. Abundant by the Ettrick and Tweed, Galashiels, 1908.
- 1218 *VALERIANA PYRENAICA* L. First record, Farquharson in *Proc. Berw.* 85, 1876, *l.c.* In Langlee Woods, Roxb., strong-growing plants with large leaves. See *Tr. Bot. Soc. Edin.* 41, 1909. At Torwoodlee and Yair Bridge, Selk., I. M. H., 1908.
- 1219 *KENTRANTHUS RUBER* Druce (*CENTRANTHUS*). Huln Abbey, Berw., Thompson, 1807.
- 1229 *DIPSACUS FULLONUM* L. Near Netherbyres House, Berw., Johnston *Fl.* 291, 1831 ; same place, Johnston *N. H.* 101, 1853 ; Tweedside, Selk., I. M. H. in *Tr. Bot. Soc. Edin.* 40, 1909.
- 1240 (2) *AGERATUM HOUSTONIANUM* Miller. On pebbles by the Tweed at Melrose, Roxb., I. M. H., 1914.
- 1244 *SOLIDAGO LANCEOLATA* L. Several colonies on the banks of the Gala, Selk., I. M. H. in *Tr. Bot. Soc. Edin.* 42, 1909.

- 1244 (2) *S. SEROTINA* Ait. Abundant along the banks of the Tweed, Selk., Roxb., and Berw., G. C. D. and I. M. H. in *Tr. Bot. Soc. Edin.* 148, 1912. Noticeable for its purplish stems.
- 1249 *CALLISTEMMA CHINENSIS* (L.) Druce *C. HORTENSIS* Cass. *CALLISTEPHUS*. By the Tweed near Dryburgh, Roxb., I. M. H., 1915.
- 1250 *ASTER SALIGNUS* Willd. Melrose, Roxb., Stuart in *Proc. Berw.*, 1869.
- 1254 *A. NOVI-BELGII* L. In abundance on the Leader and Tweed, Berw., I. M. H., 1909.
- 1254 (2) *A. PUNICEUS* L. Junction of the Till and Tweed, Berw., I. M. H., 1915.
(*A. SALICIFOLIUS*. Tweedside opposite Fishwick Mains and Hirsell woods on the Leek, Berw., Johnston *N. H.* 102, 1853.)
- 1256 *A. ERICOIDES* L. Large clumps on an island at the junction of the Till and Tweed, Berw., I. M. H., 1915.
- 1257 (2) *A. NOVI-ANGLIÆ* L. On the Tweed below Dryburgh, Roxb., I. M. H., 1915.
- 1259 *A. LINOSYRIS* Bernh. (*CHRYSOCEOMA*). Banks of the Leader, Berw., Kelly and Shaw, 1902.
- 1301 *HELIANTHUS ANNUUS* L. At the junction of the Gala and Tweed, Selk., I. M. H.
- 1301 (4) *H. LAETIFLORUS* Pers. Near Galashiels, Selk., I. M. H., 1910, but Dr Thellung only doubtfully identifies it.
- 1302 (6) *H. SEROTINUS* Tausch. Near Galashiels, Selk., I. M. H., 1909.
- 1303 *H. TUBEROSUS* L. Near Galashiels, Selk.; Tweedside, Roxb.
- 1306 *GUIZOTIA ABYSSINICA* Cass. (*G. OLEIFERA* DC.). Abundant by the Gala and Tweed, Selk. and Roxb., I. M. H. Probably introduced with bird seed. See *Tr. Bot. Soc. Edin.* 42, 1909.
- 1338 *ANTHEMIS TINCTORIA* L. On the banks of the Gala below Galashiels, Selk., I. M. H., 1910.
- 1339 *A. NOBILIS* L. Chirnside bridge, Johnston *Fl.* 292, 1831.
- 1341 *A. AUSTRIACA* Jacq. Kelso churchyard, Roxb., A. Brotherston, 1878.
- 1343 *A. ARVENSIS* L. Pastures (*sic*), Melrose, Roxb., A. Brotherston, 1873; Berwick-on-Tweed, Thompson, 1807. Usually a weed in cultivated ground.
- 1347 *A. COTULA* L. At Kelso, Roxb., A. Brotherston, 1876.
- 1355 *CHRYSANTHEMUM PARTHENIUM* Bernh. Hedges above New-waterhaugh, Berw., Thompson, 1807. By the Gala, Selk., and on an island in the Tweed near Coldstream, Berw., I. M. H., 1911.
- 1367 *ARTEMISIA ABSINTHIUM* L. Waste ground, Berw., Johnston *Fl.* 181, 1829; near Melrose, Roxb., I. M. H., 1914.

- 1386 *PETASITES ALBUS* Gaertn. Faldonside on Tweed, W. B. Boyd ; Hendersyde wood, Kelso, Roxb., A. Brotherston, 1874.
- 1387 *P. FRAGRANS* Presl. (*NARDOSMIA*). At Dryburgh, Roxb., A. Brotherston, 1872 ; a colony, Weirhill, Melrose, Roxb., I. M. H. in *Tr. Bot. Soc. Edin.* 42, 1909.
- 1388 *DORONICUM PARDALIANCHES* L. Large beds on Tweedside, Sharpilaw, Bemersyde, etc., Roxb., A. Brotherston in *Proc. Berw.* 282, 1876 ; Tweedside, Selk., I. M. H., 1909. Johnson in Gerard *Herbal* 762, 1633, says Dr Penny tells him it grows on the cold mountains of Northumberland.
- 1399 *SENECIO VISCOSUS* L. About the riding stable at Basington, Berw., Johnston *Fl.* 184, 1829 ; at Melrose, Roxb., G. C. D. in *Ann. Scot. Nat. Hist.*, 1905 ; Innerleithen, Peebles, G. C. D., *l.c.*, 1910 ; Galashiels, Selk., I. M. H., 1909. Very common.
- 1410 *CALENDULA OFFICINALIS* L. At the junction of the Gala and Tweed, Selk., I. M. H. in *Tr. Bot. Soc. Edin.* 41, 1909.
- 1432 *CIRSIIUM OLERACEUM* Scop. At the Pot Loch near Selkirk. Fully naturalised in this locality, I. M. H., 1908.
- 1433 *C. SETOSUM* Bieb. At Hendersyde, Kelso, and Melrose, Roxb.; near Borthwick, 16 feet high, A. Brotherston, 1878.
- 1439 *ONOPORDON ACANTHIUM* L. At Berwick-on-Tweed, Thompson, 1807 ; in a field near the Tweed below Galashiels, Selk., G. C. D. and I. M. H. in *Ann. Scot. Nat. Hist.* 168, 1911. Johnston (*N. H.* 130, 1853), says this plant is carried in the procession of Freemasons in the Northern counties.
- 1443 *MARIANA LACTEA* Hill (*SILYBUM MARIANA*). At Berwick-on-Tweed, Thompson, 1807 ; Embleton, Berw., Johnston *N. H.*, 1853 ; by the Tweed between Galashiels and Melrose, Roxb., I. M. H., 1914.
- 1454 *CENTAUREA CYANUS* L. Cornfields in Berw., Johnston *Fl.* 189, 1829 ; now rare, Johnston *N. H.*, 1853 ; at Galafoot, Selk., I. M. H. in *Tr. Bot. Soc. Edin.* 41, 1909. Here often of garden origin.
- 1480 *CICHHORIUM INTYBUS* L. Recorded from near Berwick-on-Tweed, Thompson, in 1807 ; found locally in abundance in Peebles and Selk., I. M. H., 1909 ; The Glen, Peebles, Lady Glenconner.
- 1489 *PICRIS ARVALIS* Jord. At Kelso, Roxb., A. Brotherston in *Rep. Bot. Rec. Club* 187, 1876.
- 1494 *CREPIS BIENNIS* L. Edenhall, Kelso, Roxb., A. Brotherston, 1878.
- 1495 *C. NICÆENSIS* Balb. Springhall, Tweedside, Roxb., A. Brotherston, 1874.
- 1496 *C. TECTORUM* L. Woodside, Kelso, Roxb., A. Brotherston, 1878.

- 1502 *C. TARAXACIFOLIA* Thuill. Edmonston, Roxb., A. Brotherston, 1878.
- 1509 *HIERACIUM PRATENSE* Tausch (COLLINUM). Hirsell woods, Berw., Johnston, 1853. Now extinct.
- 1510 *H. PRAEALTUM* Vill. Near Galashiels, Selk., I. M. H., 1907.
- 1512 *H. AURANTIACUM* L. Farquharson in *Proc. Berw.* 85, 1876; near Bowhill, Selk., I. M. H., 1908. Have also seen this plant growing freely near Roslyn Station, Midlothian, 1916.
- 1648 *LACTUCA VIROSA* L. Banks of Tweed and Twizel, Berw., Johnston *Fl.* 133, 1829; Ayton wood, etc., Berw., Johnston *N. H.* 115, 1853; wooded bank at Merton, Berw., A. Brotherston in *Proc. Berw.*, 252, 1874.
- 1648 (2) *L. SATIVA* L. At Galafoot, Selk., I. M. H., 1909.
(A species of *TARGETES*, probably *FOETIDISSIMA*, was found in 1916 at Galashiels, Selk., by I. M. H.)
- 1665 *LOBELIA GRACILIS* R. Br. On pebbles by the Tweed between Galashiels, Selk., and Melrose, Roxb., I. M. H., 1913.
- 1674 *CAMPANULA RAPUNCULOIDES* L. Tweedside, Roxb., 2 patches, A. Brotherston in *Proc. Berw.* 438, 1872; banks of the Gala near Galashiels, Selk., I. M. H., 1912.
- 1676 *C. PERSICIFOLIA* L. By the Caddon, a tributary of the Tweed, Clovenfords, Selk., I. M. H., 1910.
- 1734 *LYSIMACHIA PUNCTATA* L. River Lyne near Romanno Bridge, Peebles, J. Fraser.
- 1736 *L. NUMMULARIA* L. Tweedbank, Milne-Graden, Berw., Johnston, 1853.
- 1739 *STEIRONEMA CILIATUM* Rafin. Horseburgh Castle, Peebles, G. C. D. in 1910; at Dryburgh, Roxb., and by the Tweed and its tributary the Leader, I. M. H., 1911.
- 1742 *ANAGALLIS FOEMINA* Mill. (*CAERULEA*). In a Mill near Duns, *Proc. Berw.* 436, 1872; St Abbs, Berw., *l.c.*, 225, 1896. (See p. 157).
- 1747 *SYRINGA VULGARIS* L. By roadside near Rink, Galashiels, Selk., and in Rhymer's Glen, Melrose, Roxb., I. M. H., 1909.
- 1749 *LIGUSTRUM VULGARE* L. Plentiful about Galashiels, Selk., but perhaps planted, G. C. D. in *Ann. Scot. Nat. Hist.* 99, 1910.
- 1750 *VINCA MAJOR* L. Near Selkirk, I. M. H., 1911.
- 1751 *V. MINOR* L. Woods about Drygrange, Berw., Johnston *Fl.* 291, 1841.
- 1777 *POLEMONIUM CAERULEUM* L. Garden outcast in Berwickshire, Johnston *Fl.* 291, 1841; in Torwoodlee woods, Galashiels, Selk., I. M. H., 1913.
- 1792 *SYMPHYTUM PEREGRINUM* Ledeb. Romanno Bridge, Broomlee, etc., Peebles, J. Fraser, 1913-14; found in large clumps among the tall grass by the Tweed at Lindean, Selk., and

- between Galashiels and Melrose, Roxb., I. M. H. See *Ann. Scot. Nat. Hist.* 178, 1911. This is almost certainly the *S. officinalis*, var. *patens* from Roxburgh of A. Brotherston in *Rep. Bot. Rec. Club* 107, 1875.
- 1796 *BORAGO OFFICINALIS* L. Waste ground about Lamberton House, Berw., Johnston, 1829; near Galashiels, Selk., I. M. H., 1911.
- 1798 *ANCHUSA SEMPERVIRENS* L. Near Grieve's House, etc., Berw., Johnston *Fl.* 1829; Old Greenlaw, Hirsell Woods, etc., Berw., A. Brotherston in *Proc. Berw.* 253, 1876; Selk., Farquharson, *l.c.*, 1876; well established in several localities near Selkirk, I. M. H., 1909; at Duns, Berw., G. C. D.
- 1808 *PULMONARIA OFFICINALIS* L. Garden outcast, Johnston *Fl.* 291, 1841; near Abbotsford Ferry, Selk., becoming established, I. M. H., 1913.
- 1810 *ASPERUGO PROCUMBENS* L. A straggler at Lillie's Lane, Kelso, Roxb., A. Brotherston, 1876; also Holy Island, N.
- 1831 *VOLVULUS SEPIUM* Medic (*CONVOLVULUS*). Ladykirk House, Berw., Johnston *Fl.*, 1829; Galashiels, Selk., G. C. D. in *Ann. Scot. Nat. Hist.*, 1910; Melrose, Roxb., G. C. D. in *Ann. Scot. Nat. Hist.*, 1905; Peebles, G. C. D., *l.c.*, 1910.
- 1840 *CUSCUTA TRIFOLII* Bab. ? as *C. EUROPAEA* L. and *C. EPITHYMUM* Murr. in a wide sense. In tares at Haymount, Roxb., A. Brotherston in *Proc. Berw.* 136, 1873; Blakelaw Edge. See *Rep. Bot. Rec. Club*, 1875.
- 1844 *LYCOPERSICON ESCULENTUM* Hill (Tomato). Abundant about the Gala and outfall of Galashiels Sewage Works, Selk., extending along Tweed into Roxb., I. M. H., 1911. Very luxuriant, 1 metre high, fruiting.
- 1850 *SOLANUM TUBEROSUM* L. Berw., Johnston *N. H.*, 1853. Introduced to Berwickshire by Lord Kaimie in 1746. Stragglers from cultivation occur by Tweed, etc., in all three counties, Selk., Roxb., Berw.
- 1854 *ATROPA BELLADONNA* L. Wooler water, N., Thompson, 1807.
- 1856 *HYOSCYAMUS NIGER* L. Ramparts, Berwick-on-Tweed, Thompson, 1807; Longcroft water, Shaw and Kelly, 1902; Whinnybrae, Galashiels, Selk., I. M. H., 1915.
- 1862 *VERBASCUM THAPSUS* L. Bed of the Till and Wooler, N., Thompson, 1807; Hirsell wood, etc., Berw.; Dryburgh, Roxb., Johnston, 1853; banks of Tweed, Lees, Floors, etc., Roxb., Brotherston in *Proc. Berw.*, 1873; near Galashiels, Selk., *Ann. Scot. Nat. Hist.* 99, 1910. Common.
- 1863 *V. VIRGATUM* Stokes. Island in Tweed near Dryburgh, Roxb., I. M. H., 1915.
- 1864 *V. BLATTARIA* L. Junction of the Gala and Tweed, Selk., also near Dryburgh, Roxb., I. M. H., 1910.

- 1867 *V. NIGRUM* L. Waste ground, Ord, Berw., Johnston, 1829 ; mill yard, Selkirk, I. M. H.
- 1874 (2) *LINARIA DALMATICA* Mill. Island in Tweed near Dryburgh, Roxb., attaining height of 5 feet, I. M. H.
- 1878 *L. REPENS* Mill. Near Galashiels, Selk., Kelly and Shaw, 1902.
- 1883 *L. MINOR* Desf. Marshall in *Proc. Berw.* 411, 1891.
- 1886 *L. CYMBALARIA* Mill. Newwaterhaugh, Berw., Johnston, 1853 ; at Kelso, Roxb., A. Brotherston, 1875 ; Galafoot, Selk., I. M. H. See *Tr. Bot. Soc. Edin.* 42, 1909. In great quantity alongside *L. dalmatica* near Dryburgh, Roxb.
- 1889 *ANTIRRHINUM MAJUS* L. By the banks of the Gala and Tweed, Selk., I. M. H., 1913.
- 1890 *A. ORONTIUM* L. Rutherford, Roxb., A. Brotherston in *Rep. Bot. Rec. Club*, 1875.
- 1891 *SCROPHULARIA VERNALIS* L. Springwood Park wood, Kelso, Roxb., A. Brotherston, 1875 ; Rhymer's Glen, Roxb., Kelly and Shaw, 1902 ; near ruined towers on the Ellwyn, Roxb., I. M. H., 1909.
- 1898 *MIMULUS GUTTATUS* DC. (*LANGSDORFII*). Several places on Tweedside, A. Brotherston in *Proc. Berw.* 438, 1872, as at Wooden Anna ; A. Kelly (*Proc. Berw.* 126, 1876) records it from Blainslie, Berw., and on the south side of Soonhope water ; established before 1844 ; plentiful along the Caddon near Clovenfords, Selk., I. M. H. ; Duns, Berw., G. C. D., 1905 ; below Peebles and at Traquair, Peebles, G. C. D. Forma *LUTEA* (*M. LUTEUS* auct.) in some abundance about Blainslie, Berw., A. Kelly, *l.c.* ; abundant throughout course of the Gala, Selk., and by the Tweed, Roxb., I. M. H., 1908.
- 1899 *M. MOSCHATUS* Dougl. On the Gala and Tweed, Selk. and Roxb. Very plentiful during successive years, I. M. H., 1908-17.
- 1923 *VERONICA TOURNEFORTII* Gmelin (*V. BUXBAUMII*). First record, *V. FILIFORMIS*, with a plate, Whiterig in Ayton parish, Berw., Johnston *Fl.* 225, 1829 ; Roxb., A. Brotherston in *Rep. Bot. Rec. Club*. 1875 ; Peebles, G. C. D. ; at Galashiels, *Ann. Scot. Nat. Hist.* 149, 1910 ; near the junction of the Gala and Tweed, Selk., I. M. H., 1911. Now common.
- 1887 *ELSHOLTZIA CRISTATA* Willd. Kelso, Roxb., A. Brotherston in *Rep. Bot. Rec. Club* 98, 1874.
- 1888 \times *MENTHA VILLOSA* Huds. (*M. ROTUNDIFOLIA* \times *LONGIFOLIA*). By the Gala below Galashiels, Selk., I. M. H. See *Rep. B.E.C.* 489, 1913.
- 1889 *M. ALOPECUROIDES* Hull. Heathpool, Tweedside, N., A. Brotherston in *Proc. Berw.* 233, 1873 ; Galafoot, I. M. H. and G. C. D., 1917.

- 1991 *M. SPICATA* L. (*M. VIRIDIS* L.). Whiteadder, Berw., Johnston *Fl.* 283, 1841; at Melrose, Dryburgh, Balfour, Bowmont Water, Roxb., Johnston *N. H.*, 1853; Ettrickbridgend, Selk., I. M. H., 1909; Galafoot, Selk., I. M. H. and G. C. D., 1917.
- 1992 *M. CRISPA* L. The Glen, Innerleithen, Peebles, G. C. D., 1917; Wooler Water. N., Mitchell in *Trans. Berw. Club* i. 30, 1836.
- 1993 × *M. PIPERITA* L. Lamberton, etc., Berw., Johnston, 1829; Tweedside, Selk., A. Brotherston, 1873; Tweedside, Peebles, G. C. D. in *Ann. Scot. Nat. Hist.*, 1910; plentiful at The Glen and near Traquair, Peebles, G. C. D., 1917; at Redbridge, below Galashiels, Roxb., I. M. H. and G. C. D., 1917; by the Yarrow, Selk., I. M. H., 1912.
- 1997 *M. GENTILIS* L. Wooler Water, N., Johnston *Fl.* 130, 1829; Whiteadder, Berw., Johnston *N. H.*, 1853; at Kelso, Roxb., A. Brotherston, 1878. Var. *HACKENBRUCKII* Briq. (*M. VARIEGATA* Sole). At Wooler, apparently wild, Johnston *Fl.* 1829; plentiful by the Tweed between Galashiels and Dryburgh, Roxb., I. M. H., 1913. This is doubtless the *M. variegata* Sole of Brotherston, Tweedside, Roxb., *l.c.* 253, 1873.
- 1999 *M. RUBRA* Sm. Whiteadder, Berw., Thompson, 1807; Tweedside, Peebles; Galashiels, Selk., G. C. D. and I. M. H. in *Ann. Scot. Nat. Hist.* 99, 1910; near Melrose, Roxb., G. C. D., 1911. Perhaps native.
- 2001 *M. PULEGIUM* L. Billymire, Berw., Johnston *N. H.* 161, 1853.
- 2017 *MELISSA OFFICINALIS* L. By the Ettrick, Selk., I. M. H., 1909.
- 2031 *SALVIA VERTICILLATA* L. Banks of the Gala below Galashiels, Selk., I. M. H., 1913.
- 2052 (20) *MONARDA DIDYMA* L. On an island in Tweed near Dryburgh, Roxb., I. M. H., 1914.
- 2059 *STACHYS ANNUA* L. Kelso, frequent in cultivated land in Roxb., A. Brotherston, 1874.
- 2092 *PLANTAGO LANCEOLATA* L., var. *AMBIGUA* (Gussone). At Galafoot, Selk., I. M. H., 1916. Perhaps a wool-alien.
- 2120 *CHENOPODIUM HYBRIDUM* L. Kelso, Roxb., A. Brotherston, *l.c.*
- 2121 *C. URBICUM* L. Hirsel woods, Berw., *Proc. Berw.* 10, 1832. Very doubtful—probably an error.
- 2129 *C. POLYSPERMUM* L. Ploughed fields, Newton Don, Berw., A. Brotherston, 1874, with var. *ACUTIFOLIUM*.
- 2171 *POLYGONUM BISTORTA* L. Newwaterhaugh House, Berw., Johnston *N. H.*, 1853; Billie Castle, Kelly and Shaw, 1902; Traquair, Peebles, G. C. D., 1917.
- 2191 *P. CUSPIDATUM* Sieb. and Zucc. On the banks of the Tweed near Melrose, Roxb., I. M. H., 1914. A showy shrub of robust growth.

- 2192 *FAGOPYRUM SAGITTATUM* Gilib. (*ESCULENTUM* Moench). Cultivated, Berw., Johnston *N. H.*, 1853; Galafoot and along the Tweed below Galashiels, Selk., I. M. H. in *Tr. Bot. Soc. Edin.* 43, 1909.
- 2199 *RUMEX ALPINUS* L. Lauder, Berw., A. Brotherston, 1874; in a glade of the East Waters, Berw., Kelly and Shaw, 1902.
- 2210 (2) *R. SCUTATUS* L. Galashiels, Selk., Stuart in *Proc. Berw.*, 1869.
- 2212 *ASARUM EUROPAEUM* L. Cowdenknowes, Berw., W. B. Boyd.
- 2214 *DAPHNE LAUREOLA* L. Netherbyres, Berw., Johnston, 1853.
- 2216 *HIPPOPHAE RHAMNOIDES* L. [Dunglass, E. Lothian, Johnston, 1853.] On the banks of the Tweed near Melrose, Roxb., I. M. H., 1913.
- 2229 *EUPHORBIA ESULA* L. Birgham Haugh, Berw., Johnston *Fl.* 239, 1841; Minto, Roxb., Johnston, 1853; Berwick walls, A. Brotherston in *Proc. Berw.* 254, 1876; abundant on a bank near Tweed Bridge between Galashiels and Melrose, Roxb., see I. M. H. in *Tr. Bot. Soc. Edin.* 42, 1909; also on an island near Dryburgh, Roxb., well-established in large clumps, I. M. H., 1915. See Benth. *Handb. Br. Fl.* ii. 735, 1865. Some of these may prove to be *E. virgata* W & K.
- 2230 *E. CYPARISSIAS* L. Hulne Abbey, Thompson, 1807.
- 2243 *MERCURIALIS ANNUA* L. Kelso, Roxb., A. Brotherston in *Rep. Bot. Rec. Club*, 1875.
- 2246 *ULMUS VEGETA* Lindl. At Traquair, Peebles, G. C. D., 1917.
- 2246 *U. CARPINIFOLIA* Boreckh., not of Lindley (*NITENS*). Near The Glen, Peebles, G. C. D.
- 2247 *HUMULUS LUPULUS* L. Paxton, Berw., Thompson, 1807; Galashiels, Selk., G. C. D. in *Ann. Scot. Nat. Hist.* 101, 1910.
- 2248 *CANNABIS SATIVA* L. Galashiels, Selk.; Melrose, Roxb., Stuart in *Proc. Berw.*, 1809; at the junction of the Gala and Tweed, I. M. H. in *Tr. Bot. Soc. Edin.* 43, 1909. Probably brought with bird seed.
- 2259 *CARPINUS BETULUS* L. In plantation, Berw., Johnston *N. H.*, 1853; at Stobo, Peebles, G. C. D., 1889.
- 2265 *CASTANEA SATIVA* Mill. Plantation, Berw., Johnston *N. H.*, 1853.
- 2266 *FAGUS SYLVATICA* L. Woods in Berw., Johnston *Fl.*, 1829; Galashiels, Selk., G. C. D. in *Ann. Scot. Nat. Hist.* 101, 1910; near Melrose, Roxb., I. M. H.
- 2268 *SALIX FRAGILIS* L. (*RUSSELLIANA*). Common in woods and hedges, Berw., Johnston *Fl.*, 1829; in Selk., A. Brotherston in *Rep. Bot. Rec. Club* 87, 1876; Galafoot, Selk., G. C. D. and I. M. H., 1917.

- 2271 *S. RUBRA* Huds. In Tweed at Rosebank, Roxb., A. Brotherston, 1872; Selk., Farquharson, *l.c.*, 1876; Peebles, G. C. D., 1889; by the Tweed below Galashiels, Selk., I. M. H., 1916. Thompson recorded *S. Helix* from Haugh-head, Wooler, N., in 1807.
- 2273 *S. VIMINALIS* L. In Berw., Johnston, 1849 and 1853.
- 2288 *POPULUS ALBA* L. Plantations frequently (?), Berw., Johnston *Fl.* 219, 1829; by the Tweed at Dryburgh, Roxb., I. M. H., 1916; Duns, Berw., G. C. D., 1907; at Selkirk, G. C. D. and I. M. H., 1917.
- 2289 *P. CANESCENS* Sm. Selk., G. C. D. in *Ann. Scot. Nat. Hist.* 172, 1911.
- 2291 *P. NIGRA* L. Plantations in Berw., Johnston *Fl.* 220, 1829; Maxwell Heugh, Kelso, Roxb., one of the oldest trees in Britain, Johnston *N. H.*, 1853, as *P. monilifera*; by the Ettrick, Selk., I. M. H. in *Ann. Scot. Nat. Hist.*, 192, 1911; at Traquair, Peebles, G. C. D., 1917.
- 2292 *P. ITALICA* Moench (*FASTIGIATA*). Nisbet, Berw., Johnston; Peebles, Selk., and Roxb., G. C. D. in *Ann. Scot. Nat. Hist.* 172, 1911.
- 2293 *P. DELTOIDES* Marsh. By the Tweed near Melrose, Roxb., I. M. H., 1914; Peebles, G. C. D.
- 2294 *P. TACAMAHACCA* Mill (*P. BALSAMIFERA* = *P. CANDICANS*). New-waterhaugh, Berw., Johnston *N. H.*, 1853. Johnston says the seed from Canada was first raised in a nursery ground at Leith in 1768. At The Glen, Innerleithen, Peebles, G. C. D., 1917; Dryburgh, Roxb., I. M. H., 1914.
- 2298 *ELODEA CANADENSIS* Michx. Large patch on the Gala above Galashiels, Selk., G. C. D. in *Ann. Scot. Nat. Hist.*, 1910; various places along the Tweed between its tributaries, the Ellwyn, near Melrose, Roxb., and the Till, Berw., I. M. H., 1909. "I found this plant on the 3rd August 1842 in the Hen-Poo at Dunse Castle, Berwickshire, in profusion. I noticed it nowhere else until 9th August 1848, when I found a few tufts of it at Newmills, in the liberties of Berwick, and in September of same year I discovered it in abundance at a still and deep reach of the Whiteadder between Whitehall and Edington Mill. In the summer of the following year the plant was noticed in many intermediate localities, and in 1850 it had occupied almost every part of the river where the water ran sluggishly almost to choking. This was so much the case at Gainstone Bridge that the weed was dredged out with graips. It multiplied, and had become a noxious weed in 1851 and 1852."—Johnston *N. H.* 191, 1853.
- 2347 *IRIS GERMANICA* L. By the Ettrick at Ettrickbridgend, Selk., I. M. H., 1910.

- 2363 (10) *TRITONIA CROCOSMIFLORA* (Lemoine) Nich. (MONTBRETIA). Near Galashiels, Selk., I. M. H., 1910.
- 2364 *NARCISSUS PSEUDO-NARCISSUS* L. Chillingham, N., Johnston *Fl.* 291, 1841; Maison Dieu, Kelso, Roxb., Johnston *N. H.*, 1853. Var. *LOBULARIS*. Whitehall, Berw.
- 2377 *GALANTHUS NIVALIS* L. Chillingham, N., Johnston *Fl.* 291, 1841; near Drygrange, Berw., Johnston, 1853.
- 2385 *POLYGONATUM MULTIFLORUM* All. Parr wood, Whitemire, Berw., *Proc. Berw.* 126, 1873.
- 2393 *ALLIUM CEPA* L. At Galashiels, Selk., G. C. D.
- 2408 *HYACINTHUS COMOSUS* L. By the Tweed near Melrose, Roxb., I. M. H., 1914.
- 2416 *LILIUM MARTAGON* L. Bemersyde, Roxb., A. Brotherston, 1872; Thirlestane Castle, Berw., Kelly, *l.c.* 126, 1876.
- 2419 *TULIPA SYLVESTRIS* L. Netherbyres wood, Johnston *Fl.* 291, 1841; Makerston wood, Roxb., A. Brotherston in *Rep. Bot. Rec. Club*, 1875; Longnewton, Roxb., W. B. Boyd.
- 2450 *JUNCOIDES NEMOROSUM* Morong. By the Tweed at Abbotsford Ferry, Selk., I. M. H., 1911.
- 2451 *J. NIVEUM* L. (*LUZULA*). At Kelso, Roxb., A. Brotherston in *Rep. Bot. Rec. Club* 78, 1874; Duns, Berw., Kelly and Shaw 1902.
- 2634 *PANICUM SANGUINALE* L. Kelso, Roxb., A. Brotherston, 1874.
- 2645 *ZEa MAYS* L. At Selkirk, G. C. D. and I. M. H., 1917.
- 2651 *PHALARIS CANARIENSIS* L. At Berwick-on-Tweed, Johnston *Fl.*, 1829; in great abundance, Melrose and Hawick, Roxb., Galashiels and Selkirk, Selk., Stuart, *l.c.*, 1868; Peebles, G. C. D. in *Ann. Scot. Nat. Hist.* 1910; still plentiful by the Gala, I. M. H., 1908-17, see *Tr. Bot. Soc. Edin.*, 1909.
- 2658 *ANTHOXANTHUM ARISTATUM* Boiss. (PUELLI). Kelso, Roxb., A. Brotherston in *Rep. Bot. Rec. Club* 187, 1876.
- 2719 *AVENA STRIGOSA* Schreber. Kelso, Roxb., A. Brotherston, 1874; along the banks of the Gala below Galashiels, Selk., I. M. H., 1911. Brotherston found both the white and the black fruited forms. See *Rep. Bot. Rec. Club* 256, 1876.
- 2720 *A. SATIVA* L. In Berw., Johnston *N. H.* 218, 1853; on an island in the Tweed near Dryburgh, Roxb., I. M. H. *A. NUDA* L. and *A. ORIENTALIS* L., occasionally cultivated, Johnston, *l.c.*, 1853.
- 2758 *POA CHAIXII* Vill. (*P. SUDETICA* Haenke). First noticed in 1863 at Kelso, Roxb., under trees, New Loudon and the Blackadder woods, Roxb., see A. Brotherston and A. Kelly in *Proc. Berw.* 129, 1873; at Galashiels, Selk., Kelly and Shaw, 1902; large patches at Eddleston, Peebles, I. M. H.,

- 1909; Mounteviot, Roxb., in immense quantity, and Darnhall, Peebles, J. Fraser in *Scot. Bot. Rev.* 40, 1912.
- 2765 *P. COMPRESSA* L. Melrose Abbey, Roxb., *Fl. Scotica*; Kelso Abbey, Roxb., A. Brotherston in *Rep. Bot. Rec. Club*, 1876; still found on walls, Melrose Abbey, I. M. H.; Galashiels, G. C. D. in *Ann. Scot. Nat. Hist.*, 1910.
- 2784 *FESTUCA HETEROPHYLLA* Lam. Kelso, Roxb., A. Brotherston in *Rep. Bot. Rec. Club* 76, 1874; by the Tweed two miles below Peebles, G. C. D. in *Ann. Scot. Nat. Hist.* 102, 1910; well distributed by the Ettrick and Yarrow, Selk., I. M. H., 1911.
- 2823 *LOLIUM MULTIFLORUM* Lam. By the Tweed below Galashiels, Selk., under several modifications, I. M. H., 1914.
- 2823 *L. BOUCHEANUM (ITALICUM)* Braun. Galashiels, Selk., G. C. D. in *Ann. Scot. Nat. Hist.*, 1910; by the Tweed between Galashiels and Melrose, Roxb., I. M. H. See *Tr. Bot. Soc. Edin.*, 1909.
- 2835 *SECALE CEREALE* L. Cultivated in Berw., Johnston, *l.c.*; along the Gala within the burgh of Galashiels, Selk., I. M. H. See *Tr. Bot. Soc. Edin.* 44, 1909.
- 2836 (2) *TRITICUM DURUM* Desf. Galaside, Galashiels, Selk. See, for varieties, Johnston *N. H.* 220, 1853.
- 2852 *HORDEUM VULGARE* L. Cultivated in Berw., Johnston *N. H.*, 1853; at the junction of the Gala and Tweed, I. M. H., 1917.
- 2853 *H. HEXASTICHON* L. } Both cultivated in Berw. Johnston *N. H.*,
 2854 *H. DISTICHON* L. } *l.c.*
- 2862 *TAXUS BACCATA* L. Woods in Berw., Johnston *Fl.* 221, 1829; Dryburgh Abbey, Roxb. In 1763 this tree measured 6 ft. 11 in girth. Stobo, Peebles, 1889; Galashiels, Selk., G. C. D. in *Ann. Scot. Nat. Hist.*, 1910.
- 2864 *PINUS SYLVESTRIS* L. "Brought from Canada half a century ago."—Johnston *Fl.* 209, 1829. On the shingle of the Ettrick, Selk., I. M. H. in *Ann. Scot. Nat. Hist.*, 1910. Planted in all the Tweedside counties.
- 2865 *LARIX DECIDUA* Mill (*EUROPAEA*). Seedlings by the Ettrick, I. M. H., 1909. Frequently planted in all the counties of Tweedside. See Johnston *N. H.* 189, 1853.
- ABIES PECTINATA*, Silver Fir, and *A. EXCELSA*, Spruce, are both extensively planted. See Johnston *N. H.*, 1853.

INDEX.

A.

Abies, 291.
Acaena, 66.
Acer, 278.
Achillea, 117.
Achyrodes, 245.
Aconitum, 273.
Actaea, 273.
Adonis, 273.
Aegilops, 266.
Aegopodium, 280.
Aera, 239.
Aesculus, 278.
Agatacha, 90.
Ageratum, 281.
Agrimonia, 279.
Agrostis, 230, 236-239, 266.
Aira, 239.
Allium, 290.
Alopecurus, 224, 233.
Althaea, 277.
Alyssum, 274.
Amaranthus, 176-183.
Ambrina, 192, 199, 200, 202.
Amellus, 89.
Ammi, 76.
Anagallis, 157, 284.
Anchusa, 285.
Ancistrum, 66.
Anisacantha, 206.
Anthemis, 118, 282.
Anthocerastes, 109.
Anthoxanthum, 290.
Anthriscus, 76.
Antirrhinum, 286.
Apera, 239.
Apium, 76, 280.
Aquilegia, 273.
Arabis, 274.
Archangelica, 281.
Arctotis, 145.
Arenaria, 277.
Argemone, 3.
Artemisia, 119, 129, 131, 282.
Arundo, 243.
Asarum, 288.
Asperugo, 285.
Asperula, 281.
Asphodelus, 213.

Aster, 92, 282.
Astrolobium, 62.
Atriplex, 203.
Atropa, 285.
Avellinia, 248.
Avena, 236, 240, 247, 248, 290.

B.

Bahia, 117.
Barbarea, 274.
Bassia, 206.
Benedicta, 149.
Berberis, 273.
Berkheya, 145.
Bidens, 114.
Blitum, 179, 186, 199, 203.
Borago, 285.
Brachycome, 85.
Brachypodium, 264.
Brassica, 10, 11, 275.
Briza, 249.
Bromus, 248, 254, 256-262, 264.
Bulliardia, 68.
Bunias, 35.
Bupleurum, 74, 280.

C.

Culamagrostis, 238.
Calceolaria, 170.
Calendula, 145, 283.
Callistemma, 282.
Callistephus, 282.
Calotis, 85.
Camelina, 10.
Cammarum, 273.
Campanula, 156, 284.
Cannabis, 288.
Cantua, 158.
Capnoides, 274.
Carbenia, 149.
Cardaria, 14.
Carduncellus, 150.
Carduus, 146.
Carpinus, 288.
Carthamus, 150.
Carum, 280.
Castanea, 288.
Caucalis, 77, 80, 81.
Cenchrus, 221.

Cenia, 127.
Cenocline, 121.
Centaurea, 147, 283.
Centipeda, 127.
Centranthus, 281.
Cheiranthus, 274.
Cheiroloma, 87.
Chelidonium, 4, 274.
Chenolea, 206.
Chenopodium, 184-202, 287.
Chloris, 242.
Chrysanthemum, 282.
Chrysocephalum, 104.
Chrysocoma, 90, 282.
Chrysurus, 245.
Cichorium, 283.
Cineraria, 92.
Cirsium, 283.
Claytonia, 277.
Clematis, 273.
Cnicus, 149.
Cochlearia, 274.
Combesia, 68.
Conringia, 10.
Convolvulus, 285.
Conyza, 94.
Coriandrum, 77.
Cornus, 281.
Coronilla, 62.
Coronopus, 13.
Corydalis, 274.
Cotoneaster, 279.
Cotula, 119, 121-127.
Crassula, 68.
Crataegus, 279.
Crepis, 283.
Cryptostemma, 144.
Cupularia, 110.
Cuscuta, 285.
Cynosurus, 242, 245.
Cyperus, 215.
Cytisus, 278.

D.

Danthonia, 243.
Daphne, 288.
Datura, 167.
Daucus, 76, 78.
Descurainia, 5, 7.
Detris, 90, 92.
Deyeuxia, 236.
Dianthus, 275.
Dimorpholepis, 103.
Diplachne, 243.
Diplotaxis, 13, 275.
Dipsacus, 281.
Dissanthelium, 248.
Doronicum, 283.
Draba, 274.
Durieu, 80.

E.

Echinochloa, 218.
Echinosperrum, 159, 160.
Echium, 161.
Eleusine, 242.
Elodea, 289.
Elsholtzia, 286.
Epilobium, 280.
Eragrostis, 248.
Eranthis, 273.
Erechtites, 134, 142.
Erigeron, 92, 110.
Eriochloa, 219.
Eritrichium, 160.
Erodium, 43.
Erucastrium, 12.
Ervum, 63.
Erysimum, 9, 10, 275.
Eschscholzia, 274.
Euphorbia, 288.
Eupteris, 271.
Evonymus, 278.

F.

Fagopyrum, 288.
Fagus, 288.
Felicia, 90.
Festuca, 247, 251-256, 257, 291.
Fragaria, 279.
Fumaria, 274.

G.

Galanthus, 290.
Galinsoga, 116.
Galium, 82.
Gastroidium, 238.
Geranium, 43, 45, 46, 277.
Gilia, 157.
Glyceria, 251.
Gnaphalium, 97, 104, 106.
Guizotia, 282.
Gymnostyles, 129, 131.
Gypsophila, 275.

H.

Hedysarum, 278.
Helianthus, 282.
Helichrysum, 104.
Helipterum, 99.
Helleborus, 273.
Helminthia, 152.
Helopus, 219.
Helosciadium, 76.
Herniaria, 175.
Hesperis, 275.
Hieracium, 284.
Hippophae, 288.
Hirschfeldia, 12.
Hordeum, 266-271, 291.
Humulus, 288.

Hyacinthus, 290.
Hyalospermum, 101.
Hyoscyamus, 285.
Hypericum, 277.
Hypochaeris, 152.

I.

Iberis, 275.
Impatiens, 278.
Inula, 110, 112.
Iris, 289.
Isoetopsis, 131.
Ixophorus, 219.

J.

Juncoides, 290.
Juncus, 214.

K.

Kentranthus, 281.
Kentrophyllum, 150, 152.
Koeleria, 245.

L.

Laburnum, 278.
Lachnagrostis, 238.
Lactuca, 284.
Lamarkia, 245.
Lappago, 221.
Lappula, 159.
Larix, 291.
Lathyrus, 63.
Lavatera, 277.
Legousia, 156.
Lepidium, 13, 14-34, 271, 275.
Leptilon, 92.
Lepturus, 266.
Lidbeckia, 127.
Ligustrum, 284.
Lilium, 290.
Limnanthes, 277.
Limosella, 171.
Linaria, 286.
Linum, 277.
Lobelia, 154, 284.
Lolium, 264, 291.
Lotus, 278.
Lunaria, 274.
Luzula, 290.
Lychnis, 277.
Lycopersicon, 285.
Lysimachia, 284.
Lythrum, 70.

M.

Madia, 117.
Malcomia, 275.
Malva, 41, 42, 277.
Mariana, 283.
Mariscus, 217.
Marrubium, 172.

Matricaria, 118.
Medicago, 50-56, 278.
Melilotus, 56.
Melissa, 287.
Mentha, 286.
Mercurialis, 288.
Millotia, 106.
Mimulus, 286.
Modiola, 42.
Mollugo, 40.
Monachne, 219.
Monarda, 287.
Monolepis, 203.
Monopsis, 154.
Monsonia, 49.
Montbretia, 290.
Myagrum, 11, 35.
Myriogyne, 127.
Myrrhis, 281.

N.

Narcissus, 290.
Nardosmia, 283.
Nassella, 228.
Nasturtium, 5.
Navaretia, 158.
Nazia, 221.
Neoccis, 134.
Neslia, 34.
Nicandra, 165.
Nicotiana, 169.

O.

Oedipachne, 219.
Oenothera, 72, 280.
Onagra, 72.
Onopordon, 283.
Ornithopus, 62.
Oryzopsis, 230.
Oxalis, 278.

P.

Panicum, 218, 219, 221, 290.
Papaver, 3, 274.
Paronychia, 174.
Pentzia, 119, 121.
Petasites, 283.
Petroselinum, 280.
Peucedanum, 281.
Phacelia, 158.
Phalarideum, 248.
Phalaris, 223, 290.
Phlox, 158.
Physalis, 163.
Picris, 152, 283.
Pilea, 212.
Pimpinella, 281.
Pinus, 291.
Pisum, 278.
Plantago, 173, 287.
Pleiogyne, 124.

Poa, 250, 251, 290.
Polemonium, 284.
Polycarpon, 40.
Polygonatum, 290.
Polygonum, 208, 287.
Polypogon, 233.
Populus, 289.
Prunus, 279.
Pteris, 271.
Pulicaria, 110.
Pulmonaria, 285.
Pyrus, 279.

R.

Radicula, 5.
Ranunculus, 1, 273.
Reseda, 36, 275.
Ribes, 279.
Roemeria, 4.
Roripa, 5.
Rosa, 279.
Rotboellia, 266.
Roubieva, 202.
Rumex, 208-212, 288.

S.

Salix, 288.
Salsola, 199.
Salvia, 287.
Sambucus, 281.
Santia, 233, 236.
Santolina, 119.
Saponaria, 37.
Saxifraga, 279.
Scandix, 77, 78.
Schoenodorus, 258.
Sclerochloa, 251.
Scleropoa, 251.
Scrophularia, 286.
Secale, 291.
Sedum, 280.
Sempervivum, 282.
Senecio, 13, 14.
Senecio, 134, 136-144, 283.
Serrafalcus, 258-261.
Setaria, 219.
Sherardia, 82.
Silene, 37, 272, 277.
Silphiosperma, 85.
Silybum, 283.
Sinapis, 11, 12, 275.
Sison, 76.
Sisymbrium, 5-9, 275.
Solanum, 162, 285.
Solidago, 281.
Soliva, 129.
Sophia, 7.
Specularia, 156.
Spiraea, 279.
Stachys, 287.
Staphylea, 278.

Steironema, 284.
Stenochloa, 248.
Stipa, 225, 252.
Strongylospermum, 124.
Stuartina, 96.
Stupa, 225.
Symphoricarpos, 281.
Symphytum, 284.
Syringa, 284.

T.

Tagetes, 284.
Tanacetum, 119, 121.
Taxus, 291.
Thlaspi, 275.
Tilia, 277.
Tillaea, 68.
Tordylium, 81.
Torilis, 81.
Toxanthes, 109.
Trachynia, 264.
Tragopogon, 153.
Tragus, 221.
Tricholobos, 7.
Trifolium, 58, 59-62, 278.
Triptilodiscus, 103.
Trisetum, 247.
Triticum, 291.
Tritonia, 290.
Tropaeolum, 277.
Tulipa, 290.

U.

Ulmus, 288.
Urospermum, 153.
Urtica, 213.

V.

Vaccaria, 37.
Valeriana, 84, 281.
Valerianella, 83.
Verbascum, 285.
Veronica, 171, 286.
Vicia, 62, 278.
Vinca, 284.
Viola, 275.
Vogelia, 34.
Volulus, 285.
Vulpia, 248, 252, 254.

W.

Wilckia, 275.

X.

Xanthium, 112.

Z.

Zea, 290.



188127

Bot.
Flora
H.

Author Hayward, Ida M. and Bruce, George Claridge

Title The adventive flora of Tweedside.

DATE

University of Toronto
Library

DO NOT
REMOVE
THE
CARD
FROM
THIS
POCKET

Acme Library Card Pocket
Under Pat. "Ref. Index File"
Made by LIBRARY BUREAU

